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APPENDIX

Montana Department of Natural Resources and Conservation

Draft Real Estate Management Programmatic Environmental Impact Statement Appendix

June 21, 2004

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Appendix A

Public Comments and TLMD Staff Comments Following Issuance of Initial Scoping Document and prior to Release of DPEIS

The following is a listing of comments received by letter, e-mail, phone or fax after release of the Initial Proposal. Where a comment cited a specific section of the Initial Proposal, it was listed in the outline below. Comments not assigned to the Initial Proposal outline were grouped by general theme and issue categories. The order of the topics / issues does not imply importance.

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1 Purpose of and Need for the Proposed Plan

1.1 Purpose

- The purpose of the programmatic plan on page 2 should be to establish a framework by which the agency will identify and classify lands for special use management. (SC-68.3)

1.2 Need

- Page 2, 1.2: I feel the statements are absolutely false. Resource management is still the best use of most school trust lands. Only a relatively small proportion of trust land is suitable for high return special uses. (SC-23.10)
- Page 2, 1.2: Is it accurate to consider minerals as managed for sustained yield in the same context as crops and timber? (SC-75.3)

1.3.1 Mission Statement

- The Mission Statement should be revised to include DNRC's clear commitment to protection of environmental health and community wellbeing. (SC-47.2)
- The mission statement of the Special Use Management Program should include consideration of community concerns. (SC-68.4)
- I agree with the Mission Statement in general as long as environmental factors take priority. (SC-77.7)
- We believe that the presumption in this plan that DNRC needs "to generate increased and diversified revenues from alternative management strategies" is a departure from the Trust land Management Division's existing mission statement which states, "Manage the State of Montana's trust land resources to produce revenues for the trust beneficiaries while considering environmental factors and protecting the future income generating capacity of the land." This change gives short-term gains priority over protecting the long-term trust assets. The premise of the school trust is a land-based ethic whereas the premise of the Plan is a transition from this land ethic to a strictly monetary return. (SC-69.1)

1.3.2 Objectives of the Programmatic Plan

- Page 3, 1.3.2 I don't fully agree with the objectives. First objective should be to secure "the greatest measure of legitimate and reasonable advantage to the trust beneficiaries. (SC-23.11) Fifth objective should delete "for special uses". The objective is to protect the long-term income generating capacity of the land for all uses. (SC-23.12)
- Page 3: The document states the plan will provide benefits to "DNRC, the trust beneficiaries, and the public". FWP supports this broad interpretation, and encourages DNRC to develop the plan and alternatives based on this concept. (SC-75.4)
- Page 4, Objectives: "Protect the long-term viability of trust land for special uses". FWP thinks this objective is misstated in only referring to special uses. Long-term viability for all uses should be considered. (SC-75.5)
- The phrase "generate increased revenue" in the first objective is unclear, in that it

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could mean an increase "overall" (from the management of all special-uses as a collective whole) or "on each and every parcel". There is considerable difference in the two. Which is meant? If it is the former and not the latter, something should be said to that effect, to prevent anyone's shifting of the meaning from the whole to each of its parts. (SC-70.2)

- As regards the management which is to achieve such increase, are there any limiting parameters within which it must operate? Beyond the State Constitution and various laws, there is Objective 5 ("protect the long-term viability of trust land for special uses") that presumably provides a constraint. But what does the phrase mean? Any special use like (say) development of a commercial center is going to eliminate the land's potential for a good many other special uses, and do so for a long time; but I don't suppose such a use would be precluded under this objective even though it impairs the long-term viability of that land for many special uses. But apart from the State's divesting itself of ownership of the land or allowing something like industrial pollution with hazardous material, I can't think of what is intended in the objective as it is presently phrased. (SC-70.3)
- The only other objective which I see as providing some limiting context for management intent on generating increased revenue is the second one, referring to MEPA and the Montana Antiquities Act "in their most current form". But what does that mean for MEPA, given the recent legislative action to revise that act? I ask that not simply out of ignorance about what exactly the legislative action was, but also because I note in the Mission Statement a phrasing which I suppose is linked with the reference in the objectives to MEPA, namely, "while considering environmental factors". Now I know from long experience in public planning and plan-implementation efforts that in that context the term "consider" is subject to quite varied interpretation. It can mean no more than list explicitly the environmental factors involved, take note that these are present, and then dismiss them, give them no or little weight in the decision. On the other hand, it can mean to note and give significant weight to environmental factors. Does the revision of MEPA, and the use of the weasel-word "consider", mean that the agency's management actions will not take seriously the environmental impacts of its actions? (SC-70.4)
- Objectives 3, 4, 6, and 7 are process-oriented, both internally to the agency and in its relation to other agencies (local governments) and to the public. I applaud the direction of all four, but would raise a question concerning the nature of the commitment which the last two represent. In 1.6.2 you call attention to the commitment to follow the law, but in the course of doing so point to places in state law that exempt the agency from certain regulations and requirements that private entities must follow in the development of land. I have no quarrel in principle with such exemption, since I think that public agencies are meant to serve common purposes important to all citizens of Montana and that achievement of such purposes occasionally needs the superior weight provided by those exemptions. But there is to my mind another side to that status of serving a common purpose: the reason which makes those purposes weightier (that they relate directly to our common good) also requires that the public agency pursue those purposes in a spirit which is in keeping with the higher character of the purpose being served. Put generally, that means: as a public (State) agency serving a public purpose, DNRC should function and act differently from private individuals and entities, and should hold itself (and be held) to an appropriately higher standard given its nature as a public entity. The "differently" in question means (among other things) "wholeheartedly mindful of State

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government's function to support the citizens of the state" both as a whole and collectively and (so far as possible) distributively as well. Unfortunately there is an arrogance of ‘higher authority' ('we don't have to follow your rules and regulations, but will do what we want regardless') that having the legal right to exemption can induce. Especially where this public agency is undertaking actions which are normally those of private entities and which for the latter are subject to certain regulations and processes that are meant to assure that private actions are consistent with or contribute to the public good, it should not stop with a merely formal commitment of itself to what objectives 6 and 7 outline. Rather as a public agency it should make a good-faith effort to achieve its own public purpose within the local context by involving the public and following the relevant local rules and regulations. That may occasionally fail to elicit support for the project as it is being proposed (initially and even after some adaptation), and the exemptions need to be invoked as a last resort. But only if the commitment to begin with was sincere and more than nominal, only if the effort to involve the public and to accommodate the local citizenry, their local government, and their locally-defined common good, was good-faith and pro-active, has the State agency acted in keeping with its nature as public and has it the moral-- and not simply legal-- right to proceed on its proposed course. (SC-70.5)

1.4 Scope of this Initial Proposal

1.4.1 The Planning and Scoping Process

- I have three concerns: (1) the limited public participation in the scoping process (2) the lack of a mapped inventory of State trust lands, to enable DNRC staff and the public to understand how the lands are currently being used; and (3) the apparent segregation of other Trust Land Division bureaus from the planning process. My suggestions are:
    - Establish a citizens advisory committee of lessee, local government, school, business, and environmental representatives to advise DNRC staff in the development of the plan.
    - Inventory all State trust lands and map the information, as the very next step in your planning process.
    - Add a colleague from each of the other bureaus to your project planning team, or at least plug them into periodic reviews of the plan as it develops. (SC-47.1)
- The plan should focus on State trust lands within urban and urbanizing communities. These are the areas most likely to have the infrastructure needed to support more intensive development. More rural areas should be low priority. (SC-47.3)
- The plan should contain a reference guide summarizing all local and state laws and regulations that might pertain to special uses. (SC-47.9)
- Fundamentally, we want to point out that since the actions proposed by the State have implications for the health and welfare of the people of Montana, the State should ensure that all alternatives considered in the EIS are consistent with the state constitution that recognizes the right of all Montanans to a clean and healthful environment. (SC-68.1)
- To develop a plan for managing various lands, it would seem to me necessary to inventory what you have. Such an inventory would include at least a description of the location, nature, and current function(s), of the land areas involved, and in each case a characterization of the land's relation to surrounding lands and land-uses, of the way in which it is currently integrated into a context and is currently functioning in relation to its context. In particular, I think of ecological features of the land, which

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would be broader than any single parcel or set of parcels (does the land have a role in a larger natural area?), and of the socio-economic nature of surrounding land-uses (are those uses dominantly agricultural, or residential, or...?). Unless the plan is simply a reaction-guiding document, and not pro-active as a management plan can and should be, a good inventory would seem essential at the start. But I see no sign of it in the present proposal. (SC-77.1)

- In the scoping document it is unclear which lands that DNRC manages will be included and/or affected by this plan. Criteria needs to be developed that establishes which lands are going to be selected for inclusion in the Plan, not managed under this Plan, or deferred from this Plan. In other words, which lands fall under plan's jurisdiction and which don't. How many parcels of State lands are nearby or adjacent to urban areas? How many acres are likely to be considered for development within a specified time frame? How many acres of DNRC lands are considered critical wildlife habitat? How many acres have potentially conflicting land uses that are likely to occur within a specified time frame? Maps (including legal descriptions) identifying these lands need to be displayed in the EIS, as well as maps that identify any overlap or potential conflict between the State Forest Land Management Plan and this plan. (SC-69.5)
- Page 4, 1.4.1: The third paragraph references “mitigation measures found in state and federal law”. Usually mitigation measures are developed by ID team members, decision-makers, and project leaders to address specific concerns. Suggest deleting “found in state and federal law”. (SC-23.13)

1.4.2 Initial Public Scoping

- Why do you always leave Butte out of the scoping meetings? We have more state land in southwest Montana than in other areas. Are you afraid of us? (SC-5)
- Why no meeting in Great Falls? (SC-29.1)
- The 5.2 million acres belongs to the people of Montana, as stated in the Montana Constitution. Land sales or exchanges need close scrutiny by the public (SC-22.4)
- The EIS is very important in Billings because of the checkerboard pattern of state sections in high growth areas. There has been very little public discussion of this issue here, and I don't believe the import is fully understood. Is there any possibility of getting the response deadline postponed? (SC-60.1)
- I am concerned that organizations, local government and individuals in the eastern part of the state may have been unaware of the scoping and initial document preparation of this EIS. Many local municipal and county governments are in the process of updating their land use plans and may have concerns about how state lands might conform with those plans (SC-66.1, SC-83.1)
- Since the Legislature and the current Govemor has signed into law new legislation pertaining to MEPA, it is reasonable for citizens to request a time extension of the April 27, 2001, deadline. (SC-72.2)
- Since the Legislature and Governor have signed into law new legislation pertaining to MEPA, it is reasonable to request a time extension. (SC-72.30)
- I HEREBY REQUEST THAT SCOPING BE EXTENDED so that I and others may have the opportunity to more fully comment for the following reasons:
  - The last legislature made major revisions to MEPA. You have indicated in your draft that you will follow the new MEPA law. The Public needs guidance from you on how these changes will effect this project.
  - The Public has not been informed adequately of this project to provide meaningful scoping comments. (SC-77.1)

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1.4.3 Issues Identified in the Development of the Initial Proposal

- In §1.4.3, the State should include water quality as an issue that needs to be specifically addressed. (SC-68.5)
- The notion of "appropriate" locations for various special uses is a very complex one, and of such nature that Issues 3, 5, 7, and 8, are really part of this issue, since they relate to the impacts of development and the local government processes for managing development of private land within that government's jurisdiction. I would suggest that the siting of this or that special use in a place involves at least two different types of appropriateness or (as it is called in 2.3.4) "suitability".
    - a. The suitability of the land physically for (support of) the use in question: for example, appropriate topography and soils for building, or suitable landscape for wildlife habitat, or land appropriate for development that features its historical role or an archaeological site and the like.
    - b. The appropriateness of the location of that use on the land in question, given the impacts on and beyond the land by the location of that use there: for example, the appropriateness of locating an industrial development on an urban site that is surrounded mainly by residential housing.
    - These forms of appropriateness are not only not the same but may be in conflict: land suitable physically for residential development may well be inappropriate for such development when its context and its impact on elements of that context are considered. (SC-70.7)
- Page 5, 1.4.3: I suggest adding an issue as follows: “Determining the best combination of potential uses that will fulfill trust obligations and minimize unnecessary adverse impacts to the human environment”. (SC-23.14)

1.4.4 Issues Eliminated from Detailed Study

- This plan will have limited value, at great expense, as long as it will not address all management activities occurring on trust lands. Integrated management is most efficient. (SC-17)
- It is distressing to see that the really important issues (ag & grazing, mineral, timber management) will remain “as is” and not be subjected to this review (SC-27)
- The plan should address the impact of a more aggressive special uses program on the agricultural, mining, and timber industries of Montana. Individual suitability assessments should also weigh the pros and cons of, for example, depleting the amount of land area available to local ranchers for grazing. (SC-47.8)
- DNRC is under a multiple-use management concept since 1969. This means that wildlife habitat and public access for recreation should be on equal footing with other uses (SC-22.1)
- Please include a section on managing recreation use licenses in this plan. The state is not maximizing income from this program. Where income from recreation exceeds other uses, recreation needs to become the dominant use in management considerations. (SC-10)
- I do not agree with separating general recreational use from the plan. I believe ignoring general recreational use (outside scope) while capitalizing on special recreational use doesn't work. (SC-23.7)
- While recreation permits are not covered by this plan, they should be, because changing land uses will change the availability of recreational opportunities (SC-26.3)
- Page 15, 2.3.4: Throughout the document there appears to be minimal consideration of the importance of maintaining public access. This appears contrary

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to the priority the land board has placed on access to state lands or other public lands in their exchange policy. A section should be added to list critical public access or recreational values. Often public access is desirable on the same property that has unique real estate amenities. At a minimum, the plan should consider public access easements in lieu of real estate amenities. (SC-75.13)

- Page 5, 1.4.3: The document fails to recognize pubic access and recreational use as major issues that need to be addressed while providing income for the trust beneficiaries. (SC-75.6)
- I do not agree with separating some ROW's from the Plan. Just because there are procedures for ROW doesn't mean we can't manage them. How about tracking down trespass use? Developing/planning corridors for use? Maybe we should secure access to all state land as part of special uses. Maybe we should identify needs for change to existing policies/procedures. (SC-23.6)
- Why are rights-of-way easements not included in this programmatic EIS? (SC-68.57)
- Page 6, 1.4.4: Managers can't ignore non-special uses of state land. There may be a need for the plan to acknowledge things such as public access through a cabin site development. (SC-23.15)

1.5 The Decision to be Made

- The ROD must be issued by the Land Board not the Director of the DNRC. The Land Board cannot delegate this responsibility to the DNRC. The MT Constitution requires that the Land Board "classify land" Art X Section (4) MT Constitution. (SC-77.10)
- This Programmatic EIS is of long-term significant interest to the State and the public. The agency is the appropriate body to develop the EIS. It will guide future activities on State lands for generations to come. Therefore, given the magnitude of the decision, it is only appropriate that the fiduciaries of the trust make the final decision on which alternative is most appropriate. (SC-68.2)
- Page 6, 1.5: MEPA rules outline items a decision-maker must address. Determine if the alternatives meet objectives, if issues are adequately addressed, the need for further analysis, and selection of alternatives, significance of impacts. (SC-23.16)

1.6.1 Legal Framework

- Perhaps the most important component of this EIS is what happens once it is complete. MEIC strongly believes the most consistent, judicious and accurate way to implement this EIS is through rulemaking. Therefore, we believe the State should agree that it will implement its final decisions in rules under the Montana Administrative Procedures Act. (SC-68.62)
- The reclassification process implies that in the initial process for Development of the Special Uses Management Plan can become a constitutional issue. If each parcel of land, or portfolio, is reclassified for "fair market value" based upon the current conditions of the market especially if the economic return on the land is in conflict with the desires of the public. The perception that economic values have a priority over other values seems to conflict with the Montana Constitution which states explicitly that citizens have "the right to a clean and healthful environment"(section 3. Inalienable rights). And the Enabling Statue, section 11, clearly states that revenues generated from lands granted are for the "maintenance of schools and institutions." The latter statue does not discuss the idea of "greatest Monetary return," or "fair market value" in the assessments of fees for leases. (SC-72.7)
- Another point is that economic values without an adequate MEPA process can also

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in certain cases be in violation of Federal Law. This is especially important because state property comes also under Federal guidelines and if it can be proven that the "greatest monetary return" is harmful to the environment than there will be federal consequences as well. For instance, the previous MEPA laws were stricter than the NEPA policies. The Montana Legislature has greatly weakened the public process, and it has weakened the environmental management of environmental standards. The issue of reclassification of public lands for "the greatest monetary return" might therefore be in conflict with Federal law, and again the burden will fall on the taxpayers. (SC-72.8)

- DNRC relies on 77-1-601, MCA as authority (DNRC even claims it is a mandate) to manage trust lands to maximize revenues for the several school trusts. But DNRC apparently does not recognize the limitations imposed by the last clause of the section and that in so doing the economy of the local community as well as the state is benefited as a result of the impact of such development " (emphasis added). This language clearly requires development of trust lands to ensure benefit to the local economy as well as that of the state. Before DNRC can proceed with urbanizing development of trust lands, it must ensure that a proposed development will not adversely affect a local government's tax base/revenues or the local private business sector - income, employment, and sales. (SC-81.2)
- Also, 77-1-605, MCA, in outlining types of developments on trust lands, does not specifically mention residential, commercial or industrial uses among those "contemplated." I suppose the term "may include" does not exclude urban uses, but the language, read together with 77-1-601, is certainly no mandate to urbanize trust lands located near cities and towns. In addition, the phrasing "... will develop or conserve the various state land resources..." tempers any perceived mandate that DNRC must maximize trust revenues at all cost. (SC-81.3)
- Interestingly, to my knowledge, all of DNRC's past or proposed urban developments comprise commercial, industrial or recreational uses. For some reason, DNRC has not proposed residential development. Is DNRC avoiding residential development because the department believes that it can be exempt from local subdivision review under 76-3-205 (2), MCA, an exemption for state lands under the Montana Subdivision and Platting Act? If that is DNRC's position, the department is misusing, if not abusing, the exemption to the state subdivision law. In 1975 the state lands agency wanted an exemption from subdivision review where an agricultural lessee had built a residence on state lands and the agency wanted a simple process to convey that portion of a trust tract to the lessee. Because that situation seldom occurs, the exemption, used as intended, seemed innocuous. No one ever conceived of commercial or industrial uses on state trust lands in 1975, and as a result, 76-3-205 (2), MCA, used the phase "for residential purposes." The provision intended to limit the use of the exemption to creation of one parcel of trust land. For DNRC to develop massive high-density urban commercial subdivisions under this exemption is absolutely improper. (SC-81.7)
- Does the language in 77-1-601 and 77-1-605, MCA, provide legal authority for DNRC to develop urban uses on state trust lands? Does the statute mandate that DNRC proceed with urbanizing trust lands? (SC-81.10)
- State lands must be managed to meet the MT constitutional right to a clean and healthful environment: "ARTICLE 11. Section 3, and the obligation of the state and, each person (sic to) maintain and improve a clean and healthful environment in Montana for present and future generations." ARTICLE IX. Section 1. (SC-77.4)

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- From the clear meaning of this language (Enabling Statute, Sections 10 and 11), the following is true:
  - Granted land was never placed in trust for the schools rather it was given to the state.
  - Proceeds from granted land dispositions (defined as proceeds what would be done to private land through eminent domain, namely sale or easement) had different requirements than proceeds from leases. Both required that moneys derived be placed in a fund for the support and maintenance of schools. But only moneys derived from dispositions not from leases were required to be at fair market value.
  - There is no trust expressly created by the language of the grant. If there is a trust impliedly established for the schools it is from the funds acquired not in the land itself.
  - The land granted except for the restrictions placed on it is subject to the discretion of the state.
  - There is no requirement that lands be disposed of or leased but only that if they are that the state receives the fair market value for dispositions and whatever income is generated by lease and that that money received be set aside for the purposes required of those moneys in the grant.
  - The words revenues or obligation to produce fair market revenues do not appear in the enabling language in reference to granted lands.
  - Not requiring disposition or lease of land was intentional, thus leaving the states to decide whether lands would be disposed of, leased, or retained. And allowing the State to determine the factors necessary in making these determinations. (SC-77.5)
- From the clear meaning of this language (Montana Constitution, Article X. Section 11), the following is true:
  - Granted land is public lands of the state.
  - Granted land is held in trust for the people.
  - If granted land is disposed of it is to be at fair market value and the moneys thereby derived are to be used for the purposes specified in the grant.
  - Disposal includes not only the meaning of disposal under the enabling legislation but also by lease (i.e. "such land or an interest or an estate therein").
  - There is no requirement that lands be disposed of but only that if they are that the state receives the fair market value therefore and that that money be set aside for the purposes required of those moneys in the grant.
  - The words revenues or obligation to produce fair market revenues do not appear in the MT Constitution in reference to granted lands. (SC-77.6)
- The Montana Constitution, Article II, Section 3, and Article IX, Section 1 cite the right to “a clean and healthful environment”. In my opinion these come first. Although Attorney General Woodahl came to an opposite conclusion in his opinion (Volume No. 36, Opinion No. 92 July 7, 1976): "While the Enabling Act does not say in so many words that the state is under a duty to sell or lease school trust lands, it is elementary that this trust be administered so as to secure the largest measure of legitimate advantage to the beneficiary." at 512. Times have changed since the grants to the State of MT. Mr. Woodahl's opinion in relying on decision rendered prior to the 1972 Constitution did not have the opportunity to consider the changing attitudes of the people in Montana as expressed by the 72 Constitution. (SC-77.15)
- The Montana statues governing the management of school trust lands state: These

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lands and funds are held in trust for the Support of education and for the attainment of other worthy objectives helpful to the well-being of the people of this state. The board shall administer this trust to secure the largest measure of legitimate and reasonable advantage to the state (MCA 77-1-202). Hence, the proposed plan must not emphasize economic income to the detriment of other *"legitimate and reasonable advantage to the state". Such other "worthy objectives" Include the maintenance of ecological systems that purify air and water, sequester carbon; cycle nutrients; regulate carbon: and provide habitat that allow for the maintenance of biological diversity essential to the ecological integrity and productivity of ecosystems. (SC-62.1, SC-63.1)

- On page 7, it discusses how the income generated from school trust lands goes "directly" to schools. This should more accurately reflect the reality of the school funding mechanism. That money goes to the general fund and then is indirectly distributed to schools. (SC-68.6)
- Page 7, 1.6.1: It would have been useful to include the Enabling Act as an appendix. This would allow the public a broader understanding of the trust mandate. (SC-75.8)

1.6.2 Applicable Regulatory Requirements

- DNRC should comply with all local growth policies and local planning, zoning and subdivision requirements (SC-1, SC-31.3, SC-32.3, SC-34.2, SC-38.3, SC-39.2, SC-41.2, SC-42.2, SC-44.3, SC-46.2, SC-47.10, SC-54.2, SC-56.4, SC-57.6, SC-60.2, SC-64.3, SC-65.2, SC-77.8, SC-80.6, SC-81.9)
- If the State finds itself unable or unwilling to comply with local policies and regulations it should seek a variance from the local government under the appropriate local regulations. (SC-68.39)
- Please detail how local planning regulations will impact the depth of a MEPA analysis. What would be the outcome of a programmatic analysis if a local planning board has zoned an area of critical habitat for commercial or residential development? It seems that deference to local planning regulations could provide a large MEPA loophole. (SC-63.3)
- Wouldn't it be in the best interest of Montana for the State Land Board to require any urban development of trust lands to (1) be approved by the local elected officials, (2) comply with local plans and growth policies, (3) be approved under adopted local land use regulations, and (4) be approved by the State Land Board? (SC-81.15)
- In § 1.6.2 the State should more clearly state the law regarding zoning. This does not inform the reader that DNRC is exempt from zoning requirements. (SC-68.7)

1.6.3 Relationships to Other Plans

- What if there are conflicts between the final EIS and the State Forest Plan? (SC-68.58)
- Review all adopted local plans, specifically transportation plans and consider granting trail and open space easements prior to disposition. At a minimum, inform local governments and/or land trusts and allow them right of first refusal prior to disposition in exchange for long-term protection of open space. (SC-83.2)
- The plan should include a policy whereby each special use permit would reflect the prevailing land use in the area, and not introduce a land use change of greater intensity. In other words, DNRC special uses management decisions should reinforce existing development patterns. The exception to this would be where a locally adopted plan targets an area for new types of land uses. (SC-47.4)
- The State should require transportation plans for all parcels of property. In many

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situations where the parcel is small, a transportation plan will be simple. However, in large scale development or development with high traffic flows this is critical for protecting public safety and air quality. (SC-68.29)

2.1 The Montana Environmental Policy Act (MEPA):

- Clarify the relationship between the EIS and pending legislation (SC-31.7, SC-32.7, SC-36.4, SC-38.6, SC-39.8, SC-40.6, SC-41.8, SC-46.6, SC-54.8, SC-56.6, SC-68.55, SC-69.2)
- You did not mention the public review of the sale or exchange of school trust lands as required by MEPA. This is important because there have been several illegal exchanges which actually lost revenue to the school trust. (SC-12)
- Where and when will MEPA be applied in the proposed lease process? (SC-2)
- Cumulative impacts should be thoroughly addressed. Impacts to water quality and soil productivity and compaction should be addressed. Impacts to Populations of wildlife and their habitat should be thoroughly reviewed. Threatened, endangered, and sensitive species should be granted particular consideration. Impacts to aquatic species should be thoroughly analyzed. (SC-62.7)
- What is the mechanism for addressing cumulative effects? We request that all alternatives ensure an adequate cumulative effects analysis that examines past, present and reasonably foreseeable activities. We also request that any cumulative effects analysis include an analysis of associated and anticipated activities by other land owners. (SC-68.53)
- Cumulative impacts of special uses which might result in urban sprawl should be analyzed. (SC-67.9)
- A CUMULATIVE EFFECTS ANALYSIS setting forth what would be the Cumulative environmental effects of the various alternatives proposed needs to be made. (SC-77.12)
- How will cumulative impacts be analyzed? (SC-69.9)
- Recent changes to MEPA means that MEPA is no longer sufficient to protect and enhance the human environment as required by the MT Constitution. Therefore, your agency no longer has an adequate and meaningful procedure to follow to guarantee our constitution right to a clean and healthful environment. Furthermore, legislatively mandated actions will guarantee degradation of the environment. (SC-77.2)
- You need to provide a NEPA process to the questions you have raised since MEPA is no longer adequate to the purpose. (SC-77.3)

2.2 Alternative A:

- No Action is not acceptable (SC-20, SC-72.1)
- This would be my preferred plan at this time. (SC-21)
- At this point in time, Flathead Audubon will support Alternative A. The other alternative to aggressively market special uses has us concerned. In time, DNRC could easily get a bad reputation for its “rollercoaster ride” (re: lease/license fees) that no one will consider a lease or license. Additionally, DNRC could inadvertently destroy the trust’s principle (the long-term health of our state’s natural resources) which will benefit no one. (SC-26.5, SC-56.8)
- The No Action Alternative is not a correct statement of the current obligations of the DNRC in the management of granted lands. The language used in the descriptions show a development bias and do not mention mitigation for environmental concerns, for example, on page 7 of your "Initial Proposal" you state: under the direction of the Land Board DNRC's obligation for management and administration of trust lands is

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to obtain the greatest benefit for the school trusts. The greatest monetary return must be weighed against the long-term productivity of the land to ensure continued future returns to the trusts. (emphasis added)" Although future returns is a factor, another more important factor IS the effect of development on the human environment of the proposed action for current and future generations. This important concern is omitted. Further, this statement assumes that the lands themselves are in the school trust and must produce fair market revenue for the schools. I believe this view to be incorrect. (SC-77.13)

2.2.1 Existing Program Special Use Categories

- Pages 8 – 10, 2.2.1: The categories of use are not the same as in 2.3.5. I am not real comfortable with categorizing uses. The categories seem arbitrary. Where do homesites fit in? I'm not comfortable with differentiating primary and secondary uses as expressed in leases vs. land use licenses. This system is inherited baggage. Can't we be a little more creative and change this system in our plan? I disagree with the restricted easement definition for the plan. I believe it should include all easements, with the possible segregation of easements for condemnable purposes. (SC-23.17)
- What is fair market value? Page 9 of the draft states, "DNRC may retain open space, aesthetic, or recreational values on trust lands, provided that the trust receives the fair market value of the management rights forfeited by DNRC." This sounds like a policy statement that requires further elucidation. Is the State required to receive fair market value on every management decision it makes or can it forego maximum revenue to ensure long-term benefits to the trust? How will the State require fair market value for open space and wildlife habitat? What is open space? In any development there should be some open areas. Is this open space? Who will pay fair market value, the land board, the agency, the legislature, local government, individual citizens, someone else? What if the State decides that it does not have the resources to develop a section of "open space" now but will in the future? Who should pay and how much should they pay? What if the State decides that an area will be far more valuable for development in 10 -20 years and therefore decides to leave it as open space or wildlife habitat in the interim? Will the State be forced to develop that property in a low market just to satisfy some arbitrary requirement that it get fair market value now? Again, who should pay? This requirement in the definitions raises far too many questions and should be eliminated. (SC-68.14)
- On page 9 of your "Initial Proposal" you state: "Wildlife ... may defer management activities to protect wildlife habitat, provided that the trust receives the fair market value of the management rights forfeited by DNRC" "Open space ... DNRC may retain open space, aesthetic, or recreational values on trust lands, provided that the trust receives the fair market value of the management rights forfeited by DNRC." There is no such requirement to receive fair market value. (SC-77.14)
- In the description of the categories of special use (pages 8-9), there is in two places (one in the characterization of wildlife habitat, the other concerning open space) the qualifying phrase: "provided that the trust receives the fair market value of the management rights forfeited by DNRC". What could that possibly mean? I understand the notion of land as involving a bundle of rights, separable from the whole and from each other; but I have never heard of a "management right", let alone of a market for such rights. But suppose there is such a right, why would the notion of "forfeit" not apply to every special use? If he is to gain his right to develop his special use on public land, does not any special use developer (whether

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residential, commercial, industrial, recreational, or whatever) require the State to forfeit its right to manage the land in question for any other special use? Why should that developer not also pay the State fair market value not only for the right to develop his special use, but also for the management rights forfeited in his case? What seems implicit here is a notion that, because trust-land was granted in order to support the schools, its only meaning and value as public land is its revenue-return; that means that unless wildlife habitat and open space are income or revenue producing, they are not legitimate special uses and provide no legitimate management alternatives for the public land in question. If that is so, I would think that a prudent manager would sell such land and use the proceeds to acquire other land that would be income or revenue producing. Given the market for land, that probably means getting much less acreage; perhaps more could be acquired by (a two-party or three-party) trade. But I find it hard to think that the income generated by lease or license or whatever device is appropriate for maintaining open space and wildlife habitat would come anywhere near bringing a return equal to what could be gained from the much smaller parcel(s) obtained by sale or trade and developed in one or more of the four remaining special use categories. (SC-70.8)

2.2.3 Existing Program Processes

- Page 10, 2.2.3: I question land sale and exchange as special uses, although this may be the best place for them. In reality they are processes to achieve property management objectives. They also apply to agriculture, grazing, minerals, recreation, and forest management as well as special uses. We need to make sure we aren't just proposing to do things based upon how we have done them in the past. (SC-23.18)
- In § 2.2.3 the State should provide significantly more detail regarding its portfolio management functions. Please describe what you do now in the arena of researching market conditions and trends, marketing commercial lands, and contributing to infrastructure improvements. (SC-68.8)
- Page 11, 2.2.3: "A competitive bid process conducted through a Request for Proposal may be used to solicit competitive bids for special uses". At Elmo, FWP was outbid, the lessee closed out, and DNRC has no lessee. FWP has also discontinued leases because of increased lease rates. How will DNRC evaluate the potential for competitive bidding processes that may result in long-term damage and reduced trust revenue? FWP suggests that competitive bids should be awarded based on the ability to manage activities in a way that is in the best long-term interest of the trust revenue and resource protection. (SC-75.9)

2.3 Alternative B:

- I generally favor Alternative B (SC-9)
- Page 12, 2.3: The proposed alternative would mean "more active and aggressive marketing of special uses". The EIS should address how much this would cost in terms of program expenditures. Increased expenditures should be weighed against increased revenues to the trust beneficiaries. (SC-75.10)
- Under Alternative B, recreational opportunities will only go down, and in time, will become minimal, thus rendering the recreational permit nearly worthless, which will also affect DNRC's ability to manage the trust fund (SC-26.4)
- Alternative B has many shortcomings (SC-72.2)
- The Montana School Boards Association (MSBA) supports Alternative B, however, we also recognize DNRC's obligation is not only to obtain the greatest benefit for the school trust in the short-term, but to consider the long-term productivity and value of

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the land to ensure future returns to the trust. (SC-74.1) • Please describe what you mean in § 2.3 by "more active and aggressive marketing?" (SC-68.9)
2.3.1 Program Goals • Page 15, 2.3.1: The third bullet should include income, risks “and impacts”. I agree with diversification of uses, but don’t feel special uses are suitable for a large percentage of the land base. We should focus on the limited high value opportunities. (SC-23.19) • Page 15, 2.3.1: Outlining the desired balance of “the long-term productivity of the land to ensure continued future returns to the trusts (page 7) also needs to be a goal of the program. Economic uncertainties of various leasing scenarios should be built into the analysis. (SC-75.11) • In 2.3.1 (Program Goals), six of the seven goals are financial; only the second is not (it concerns consistency in management of special uses on trust lands). That reflects the current emphasis on increasing revenue. But when the original "for the support of common schools" is translated into "generate revenue" and now into "increase revenue as much as possible", something is being ignored. Trust-land can support schools in other ways than revenue production: for example, some land is suitable for the location of school buildings and facilities; for another example, some lands can become laboratories for school-children's use in biological (botanical, zoological), historical and cultural, studies. Just as 'highest and best use' of land is not always the use that brings the greatest monetary return, so management of public lands to support schools is not always management for the most money, especially if this involves disregard of impacts on and costs to those in a local area affected by that management effort. (SC-70.9)
2.3.2 Program Objectives • Page 15, 2.3.2: The optimal future use of the land is an unclear concept. What is it that will be optimized? A variety of optimization scenarios should be evaluated in alternative development. (SC-75.12) • Section 2.3.2 states that environmental review is required by local authorities in planning and subdivision review. Meaningful analysis rarely occurs due to lack of resources available, standards of analysis and lack of state level review. The state should not rely on local environmental review without thorough review. (SC-67.5)
2.3.4 Land Suitability Criteria • Page 15, 2.3.4: I don’t like the criteria “No longer feasible to be managed for natural resource production”. There is a connotation that all uses are exclusive. I also do not like the criteria “suitable for sale or exchange”. The reader has no idea how this is determined. (SC-23.20) • On page 15 of the scoping document DNRC has identified Land Suitability Criteria several of which may potentially conflict with each other (i.e., grazing or mineral, crop and timber production vs. lands with real estate amenities such as views or water frontage vs. critical wildlife management, plant community, archeological or paleontological resource areas). How does DNRC intend to resolve conflicts if, for example, an area along a bull trout spawning stream is deemed to have high real estate value? A mechanism for conflicts must be developed and included in the final plan. (SC-69.4) • It is unclear in the document how conflicts in land use are to be resolved. Page 15 of the scoping document discusses land suitability criteria but does not discuss how to

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resolve conflicting uses. If for example, an area is critical elk winter range and a potential mine site -- what is the process for deciding between these two competing uses? (SC-68.44)

- In 2.3.4 (Land Suitability Criteria), the list of ten criteria seems to be somewhat haphazard, but this is so partly because it is addressing very different things under the same name. There is a horizon within which the criteria appear: the overall horizon of trust-land which needs to be managed in such way as makes it contribute to the support of public schools.
  - a. The first land-suitability criterion would come to light with the question: Can this-or that parcel of land be managed so as to contribute to that end? If it cannot, then it is unsuitable to retain, and thus "suitable for sale or exchange".
  - b. After sorting out lands according to this suitability-for-retention criterion, the next criterion comes to light with the question: How can it be managed so as to make the best contribution to that end? It is likely that any parcel can contribute under several different management alternatives; in particular, there are the variety of alternatives that involve general uses (timberharvest, agricultural crops, mineral production) and others that involve various special uses. At this point there are several variables that bring to light several criteria.
  - 1) The first variable relates to physical character, and the land's ability (because of its inherent character) to make a contribution in these ways but not in those: certain topography and soils may make a parcel unsuitable for building structures, but make it suitable for wildlife habitat. Different uses require different land-features for them to be possible, and land can be sorted out and classified according to the uses which its physical features make possible. This is a physical suitability criterion.
  - 2) The second variable relates to the relative location of the land, and its functions (actual and possible) in virtue of that location. Here there are different levels on which one can speak of such functions: the physical and ecological, the social and political, and the infrastructural and developmental, for example.
  - (a) On the physical level, the land may play a role in larger eco-systems which reach quite beyond the parcel itself. that could make it suitable for management with an eye to wildlife or plant communities. Having a role in one or more ecological systems makes land be suitable for management with that value in mind-- management for wildlife habitat, say. The other side of this is that if land does play a significant ecological role, management for other uses can produce impacts on the trust-land which reach beyond it, and affect the viability of larger eco-systems that make the land not an isolated parcel without significant connection with anything beyond its boundaries. We could call this the physical-location suitability criterion.
  - (b) On the social and political level, the land is located in a context that may include other public land but is likely to include private land. And here several criteria are visible. (1) If it lies within a local government planning jurisdiction, there are the questions concerning the way local plans identify the suitability of the private land for use or development; from the perspective of those plans, what management possibilities would enable the uses of trust-land to fit with those of the local planning/zoning? Would a proposed use produce conflicts-- in particular, those of the sort which zoning is meant to reduce? Here suitability concerns this matter of the fit of uses, where the context of use is established by local government. We could call this local planning suitability criterion. (2)

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Whether or not the land lies within a local government planning jurisdiction, it lies in a context of lands, land-ownerships, and established uses (what is actually happening, not what the plan calls for in future), and within the jurisdiction of some local government. That context may be rural, semi-urban or urban, or of a number of other kinds. The current functioning of such a context involves social and economic values that are important for the people in question; it also involves taxation to support and maintain the local public facilities and amenities that support the life of the people there. Whether or not a proposed management-use of trust land in their midst is suitable is in this case a function of what the impact of uses/changes on trust-land is-and is seen to be. Does it raise local taxes because of road improvements required to handle trust-land traffic? Does it diminish the quality of life desired by the people already there? etc. etc. Here suitability concerns the fit of the proposed management-use of trust-land with such a context, the degree of harmony of the impacts of that management-use on what is actually there. We could call this local use-context suitability criterion.

- (c) On the infrastructural and developmental, the land and land-use context for trust-land may involve actual (or planned) infrastructure and actual (or planned) development that makes a management alternative feasible whereas if the actual physical-and-use setting were different it would not be. We could call this local-development-context suitability criterion.
- c. Supposing that several different uses of any trust-land might be more or less suitable in terms of the preceding criteria, there is need as well for two final suitability-criteria, relating to the degree of a management alternative's contribution to the support of public schools, and to the measure in which each alternative succeeds in maintaining the long-term viability of the land in question for contributing to the support of the public schools. In both cases, the way the current proposal is being developed, it comes down to which alternative makes the most money for the schools and does so in a way that maintains the capacity of the land to continue making money. (I would not agree that that is the proper aim of agency management of trust-land; properly, the aim should be to make the greatest contribution to the support of the schools, without that contribution being measured simply in terms of revenue). We could call this the overall school-support suitability criterion. Any assessment of potential in this regard is of course complex and risky, but some standard by which to measure alternative management-uses in their contribution to the end or purpose of the agency's action is needed. (SC-70.9)

2.3.5 Program Processes to Assess Project Suitability

- Pages 16 – 18, 2.3.5: Categories of uses are not the same as in 2.2.1. (SC-23.21)
- § 2.3.5 needs some update and clarification. Please discuss the exemption the State has from local zoning requirements. Please update the discussion on subdivision review based on the most recent changes to the law made by the 2001 Legislature. In addition, the section on subdivisions should discuss the exemption the State has from most subdivision review. (SC-68.10)
- The definition of "suburban" on page 17 should include the fact that it is supposed to be near an urban area. Suburb in Webster's dictionary means "an outlying part of a city or town." The definition used in the document makes it sound like a suburb could occur in the middle of nowhere. This is contrary to the definition. (SC-68.11)
- As it is written (e.g., Appendix K), it appears that the agency may value the land and

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develop a marketing plan after an application is initiated. This analysis process, to the extent that it is an analysis, is too vague and comes too late in the process to provide any meaningful guidance. DNRC should draft alternatives to address these questions:

- What is the current value of the trust assets? What is the projected future value of the trust assets? How are the assets valued? What are the characteristics of a valuable asset?
- What criteria will the agency apply to manage the portfolio?
- What economic model will the agency use to calculate benefit and the risk? What economic model will it use to project profitability in the long-term?
- If the state intends to take more active role in management and development, how does the agency intend to calculate the cost of management in the profitability of the project? (For example as you learned in Billings, developing housing is much more labor intensive than managing a pasture.)
- Has the state applied certain criteria (perhaps like the coarse filter) that consider economic value and future growth trends?
- Does the state have a mechanism for reviewing the lands that have been designated as transition lands?
- How will the value of the trust asset be enhanced? How will the enhancement be measured? (SC-78.6)

2.3.6 Relationship to MEPA

- Page 18, 2.3.6: The first sentence needs to include a reference to the significance of impacts. Just because a project is mitigated doesn't mean it doesn't have significant impacts. If a project has uncertainty regarding the significance of impacts, an EIS must be completed. (SC-23.22)

Comments Addressing Alternatives or Suggesting New Alternatives:

General:

- I question whether Alternatives A & B are legal (SC-22.3)
- Look at how other states manage their trust lands (SC-31.5, SC-32.5, SC-34.4, SC-36.3, SC-38.5, SC-39.6, SC-40.4, SC-41.5, SC-42.5, SC-44.2, SC-54.4, SC-64.7, SC-78.8, SC-80.1)
- The two alternatives developed in this scoping document appear to be a narrow interpretation of the trust land management mission. The development of the EIS should include some discussion of the discretion allowed within the trust mandate and a full range of reasonable alternatives developed for management of special uses on trust lands. (SC-75.1
- The EIS should include a detailed description of the affected environment. As it is written now there is little discussion of the physical environment. For example, how many parcels of State lands are nearby or adjacent to urban areas? How many acres are likely to be considered for development within a specified time frame? How many acres of State lands are considered critical wildlife habitat? How many acres have potentially conflicting land uses that are likely to occur within a specified time frame? The State should adequately describe (and map) the areas it manages. The State should thoroughly describe the affected environment, the potential cumulative effects of its alternatives, and provide an accurate inventory of the major resources that will be affected. (SC-68.46
- In the public meeting discussing this document, the State said it would look at existing conditions. It was unclear what the State meant by that statement. There needs to be a mechanism for the state to identify all of those parcels that are within a

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certain distance (i.e., 10 miles) of urban areas, investigate their development potential and prioritize them for development. That is the only way the state can be proactive in the development of these parcels. Without this level of analysis the State will constantly be in a reactive mode toward development and that is what this EIS should be trying to avoid. (SC-68.47)

- The State needs a database that shows where certain uses are located. For example, DNRC needs a database on where conservation easements are. (SC-68.48)
- The EIS should include a thorough discussion of the proposed mitigation and monitoring plans associated with each alternative. For example, in the hypothetical scenario where the State chooses to aggressively market and develop its school trust lands in the urbanizing areas, how does the Department propose to control the spread of noxious weeds? How will the Department ensure that water quality is not degraded in nearby waterways? What type or monitoring protocol will be followed? What about enforcement measures? How will the Department ensure compliance with mitigation? (SC-68.50)
- MEIC is concerned that while DNRC appears to be embarking on an ambitious program to develop State lands that they may not have the staff and resources to carry out the proposal. The EIS should fully disclose the budgetary considerations associated with each alternative and a realistic assessment of whether resources will be available to adequately implement each proposed alternative. (SC-68.51)
- Rather than increasing the intensity of development, DNRC should consider increasing rates charged for current levels of activities. (SC-68.52)
- The State should develop alternatives that consider non-consumptive and nonextractive uses and that yield benefits to school children and the general public in the form of educational opportunities. (SC-68.54)
- DNRC should develop alternatives that can make use of these lands in a manner that provides direct educational benefits to schools and school students such as outdoor classrooms and study sites. These activities might provide more long-term "benefits" to the schools and the trusts. (SC-69.8)
- The EIS must identify the duration of the plan, how changes will be made to the plan and monitoring criteria developed to identify when changes need to be made. Criteria for changing the status of lands currently deferred from being included in this plan also need to be developed. (SC-69.6)
- The proposal is reactive rather than proactive. The existing and proposed processes outlined in the Appendices are triggered by an application, usually from an outside party. Instead of waiting for a proposal to come forward, DNRC should initiate the evaluation process on all of its lands and other trust assets in order to evaluate and assess the lands. It should determine what the asset is worth, determine its potential uses, prioritize the potential uses, value the potential uses with an economic model, and then actively target those types of uses. (SC-78.7)
- End Commercial, Industrial and Recreational activities as they expire. Leave state lands alone (SC-3)
- The suitablility analysis should consider eliminating inappropriate uses. Special consideration should be given to leases in forested areas which might prevent or limit natural or prescribed forest fires. (SC-67.6)
- Explore a range of alternatives (SC-23.5, SC-31.4, SC-32.4, SC-34.3, SC-36.3, SC-38.4, SC-39.5, SC-40.3, SC-41.4, SC-46.4, SC-54.4, SC-56.1, SC-57.4, SC-64.6, SC-65.6, SC-69.3, SC-78.1, SC-80.2)

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- Plan implementation. I have two concerns: (1) DNRC will not have the funds and specialized staffing necessary to implement the plan effectively; and (2) The public will be left out of site-specific special use permitting processes in rural areas. My suggestions are:
    - Besides the DNRC planners recently hired, expertise in real estate development, marketing, public involvement, conflict resolution, conservation easements, and local government finance will be critical. The plan should include an in-house staffing and funding strategy in its implementation section. The plan should also include a commitment to regular program evaluation and, as needed, plan revision. A five-year cycle would be reasonable. Public involvement should be built into the regular plan and program reviews.
    - Each Area Office should establish an ongoing citizens advisory committee, to advise DNRC staff on implementation of the Special Uses Management Plan. (SC-47.11)
- An additional Alternative C might be created that would deal with the role of adequate public participation in the reclassification process and meeting the standards set forth in our Montana Constitution. Therefore I request that the DNRC creates an additional Alternative C in its Initial Proposal for a Special Uses Management Plan and extends the deadline. (SC-72.9)
- The agency should draft an alternative that includes an initial evaluation process, like the coarse screening with an economic feasibility component, for all trust lands. It should assess the potential uses, value the property and determine a range of possible uses. Once the range of uses is identified, it should approach the local community for input. Lands that are transitional or urbanizable should be categorized as transitional lands (or a similar designation and then the state should develop a management plan, including an economic analysis, for those lands in particular. If the state had a specific plan and long-term and short-term management strategies, the agency would be more able to actively market and participate in the management of the lands. (SC-78.4)
- Additional alternatives should be considered by this EIS. I would suggest the following:
    - CONSERVATION ALTERNATIVE setting out a method to best protect granted land from environmental degradation whenever special uses are considered.
    - AN ALTERNATIVE providing for public input prior to any special use designations being made or lease, exchanges or sales being granted and providing for Land Board decision making. (SC-77.11)

GENERAL CATEGORIES:

Land-use Issues:

- Special uses should be compatible with surrounding areas. (SC-16.3)
- Special uses should be appropriate public uses of the areas (SC-16.4)
- Access (SC-15.1)
- Boundary markings (SC-15.2)
- Steer development toward areas close to existing population centers where infrastructures already exist, instead of promoting fragmentation of wildlife habitat (SC-33.4)
- Give consideration and advice to the urban area government so as not to be at odds with local area plans for development. (SC-53)
- Land trusts often work closely with local governments in their effort to develop

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"liveable communities" with plenty of green space and trail corridors. It is these kind of amenities that will make Montana communities competitive with others that are attracting new businesses and industries. State school sections near urbanizing areas should be considered within this broad economic picture and not simply for their potential to be developed as commercial, industrial or residential. In the EIS, please examine and allow for creative approaches and partnerships to provide both a mix of income and green space. (SC-66.4, SC-83.4)

- Any development should occur within Great Falls city limits as opposed to sprawl outside those limits, which is already a concern with the City-County Planning Board. (SC-71)
- Because almost all trust lands that might be developed for urban uses lie at the outskirts of cities and towns, won't residential, commercial and industrial development on such trust lands contribute to urban sprawl, increasing the costs of extending water and sewer and other services and weakening existing downtown business districts? Doesn't developing outlying lands conflict with sound planning, which tries to direct new growth into existing urban areas that have services already in place? (SC-76.2)
- The plan should include a policy whereby the impacts of a special use permit on local government and other local service providers (e.g., road systems, fire protection, law enforcement) would be estimated and fully mitigated. (SC-47.5)
- Region-by-region, the plan should include an evaluation of State trust lands for suitability for the broad categories of land use. The suitability assessment should involve local government officials, planning boards, and planning staffs who can best apply their local land use policies and regulations to a given situation. A suitability map should be prepared and included in the plan. The map would identify "prime" lands for residential, commercial, public/quasi-public, recreational, and conservation potential. If the plan itself does not do this, then this should be Plan Implementation Step #1, to be accomplished by each Area Office through a public process before new special use permits are issued. (SC-47.6
- There should be a square footage cap on all developments. Very large retail stores can be difficult to re-lease. These types of structures are usually built to suit the particular needs of one company. The State should do everything it can to guarantee that the property will be easy to re-lease. (SC-68.18)
- How would a transfer of development rights system work if an area is not subject to zoning? (SC-68.36)
- In large developments that are constructed over many years, the State should have an established phase-in criteria. The State should not allow a developer to begin phasing in a new area until the previous area is at least 80 percent constructed. This will help avoid leap-frog development. Most communities want to encourage infill development. The State should do what it can to assist communities in that endeavor. (SC-68.37)
- The proposal fails to provide overall criteria for prioritizing uses on trust lands. While the proposal does provide more criteria by which to judge individual projects, it does little to guide the treatment of trust lands, as a whole. In order for the state to manage lands profitably, it must develop and adopt criteria for valuing the assets of the trust and for managing for the highest and best use. For example, how will the agency decide which uses are more valuable, which uses are less valuable? What are the characteristics of a desirable use--non-polluting? Provides high paying jobs for the community? Highly profitable in the short term? Right now, the-state simply

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relies on the assurances of the developer that the project will be successful. Without an overall program for managing the assets of the trust, no meaningful prioritization can be conducted. (SC-78.2)

- The state needs additional criteria to determine which properties to avoid and which to target for future development. Such criteria should include but not be limited to such things as:
    - determining whether the department has adequate resources to manage the property, especially if problems develop;
    - growth patterns of the community;
    - What type of zoning exists on the parcel;
    - Whether development is anticipated in the community's growth policy
    - What type (residential, commercial, industrial, professional) of development is appropriate according to growth policies, zoning or existing development;
    - intensity of development that is appropriate;
    - community values for the property;
    - environmental constraints of the property;
    - Opportunity costs, i.e., developing now versus developing in 10 or 20 years;
    - financial risk of development;
    - ability of community to absorb the use;
    - use of surrounding properties; and
    - distance from urban area. (SC-68.43)
- Should DNRC proceed with urban development proposals if the proposals compromise, diminish, undermine or conflict with local plans, policies, assets, and values? (SC-81.11)
- Wouldn't it be in the best interests of Montanans if trust lands were developed, traded or leased for such community benefits as sites for water/sewer facilities, landfills, transfer stations, or to provide affordable housing? (SC-81.13)
- How can local officials and citizens influence development of trust lands? How can cities and towns and citizens protect local values where a DNRC proposal harms or conflicts with local plans, policies and interests? (SC-81.14)

Public Access and Recreation:

- Real estate and wealthy out-of-state landowners want our public state lands to block access to federal public lands (SC-22.5)
- Accessible state lands should not be in the BMP (SC-22.7)
- Recreational pursuits (SC-15.3)
- Prioritize ecologically sensitive lands for protection, especially those that are critically important for wildlife uses and those of unique recreation value (SC-33.2)
- State land snowmobile trails need to continue on state lands (SC-45.1)
- ATV trails need to be designated so people have an idea where they can go (SC-45.2)
- All roads developed, exchanged or leased should be open to the public. (SC-68.32)

Public Involvement:

- I recommend that all persons who provide an e-mail address be informed electronically to offset the impact of paper going to landfills (SC-4).
- Although the general objective, or mission statement, might be laudatory, it is the lack of grassroots public decision which is lacking in this initial scoping process. It has many implications which are obviously not in the interest for the people of Montana. Consideration of the value of production whether for timber, gas or oil, real

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estate near urban arm, grazing, recreation, or for whatever reason the DNRC leases, exchanges, or sells land, it calls for a continued reclassification process of school trust lands, and this is solely within the discretion of the governmental agency which has reserved the right to determine the economic conditions of the marketplace of each portfolio at any given time. (SC-72.3)

- Another implication of the initial proposal is that reclassification might not necessarily be in the interest of the State of Montana. Without a public process, citizens would have no way of establishing the importance of other values. The attempt is clearly seeking a Special Uses Management Plan based upon the idea of obtaining a "fair market value" of school trust lands in its leases, sale of the lands, or exchanges. It is proposed that economic values become the over riding factor. This determinant could conflict with public opinion, and especially when the greater weight given to economic values rather than to others such as conservation, historic, human, landscape, and natural etc. The danger is that the public does not know the status of each parcel of school trust land at any given time. The temptation is that each parcel of land is to be seen as some sort of investment like and an investment portfolio from an individual who views his/her holdings in the stock market expecting to maximize the value of shares. (SC-72.5)
- How will the agency engage the public? On a project-by-project basis? (SC-78.4)

Environmental Effects:

Socio-Economic:

- There should be no preference for sale of state land to adjacent landowners (SC-11.1)
- All leases, revenues must be equivalent to what the private sector obtains (SC-11.3)
- Competitive leasing to the highest bidder (SC-15.4)
- No sale of state lands, and trade only when the state obviously benefits more than the requesting party (SC-6)
- Consider long-term values for the future human population as having greater priority than high current market values (SC-33.5)
- Money is a factor, not the factor when evaluating School Trust lands. If an arbitrary amount of 5% return is set as the market value, many leases/licenses will be dropped and the trust will get 0% return (SC-26.2)
- Developments designed to maximize financial returns to the trust may ultimately increase governmental costs to the remainder of the community. The EIS should address this issue of additional costs to the surrounding community. (SC-75.7)
- Does the trust mandate require DNRC to capture full market value of a property when that value includes, for example, exclusive access to adjacent public lands and resources? (SC-75.14)
- The proposed suitability criterion where land is no longer economically feasible to manage for natural resource production needs more clarification. FWP understands the utility of this criterion where, for example, communities have developed around the state parcel. However, FWP has serious concerns if DNRC uses this criterion on parcels where high public resource values and associated public scrutiny of DNRC management activities exist. Marketing such parcels may only add to conflicts that have caused public concerns in the first place. Such lands should be dealt with in other ways and not included in the special uses plan. (SC-75.15)
- A thorough economic analysis of the project should be included in the environmental

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analysis. Losses of ecological integrity should be considered in the economic analysis in terms of loss of habitat and ability of the forests to provide ecosystem services. Although we recognize that it is the policy of the DNRC to conduct a non-discounted economic analysis that does not consider sufficiently future costs or non-commodity values, we believe that the narrowness of the economic analysis is unreasonable given the Mission of the trust to maximize revenue from school trust lands. The future revenue generating, potential of the trust lands must be considered. The proposed projects may not be financially responsible when considering potential future revenue generation. The large-scale soil and hydrology disruptions associated with the development and other special uses may significantly degrade the integrity of the forest and future revenue generating opportunities. (SC-62.2)

- While income generation for school trusts is a consideration in managing trust lands, the Montana Supreme Court has made clear that income generation should not be the only consideration: "Maximizing income is not paramount to the exclusion of wildlife or environmental considerations" (Ravalli County Fish and Game Association v. Montana Department of State Lands, Montana Reporter. 158-907 P.2d 1 '170, September 29, 1995). (SC-62.3)
- An economic analysis of State School Trust Lands states that: The distinction between current cash flow and asset value is especially important to those charged with managing a trust. While a private commercial business may legitimately emphasize current cash flow, treating the long run value of the business as a going concern as a secondary matter. a trustee has a fiduciary responsibility that requires that the long term value of the trust be taken into consideration. A trust is not simply a commercial business. In the context of a trust, it is not unusual to sacrifice a potentially larger current cash flow ill the protection of longer-term asset values (Power 1996). (SC-62.4)
- What is the current amount of revenue generated from special uses? What has been the amount of revenue generated each year over the last 10 years? SC-68.12)
- The State must maintain a diverse portfolio in order to effectively manage the trust in perpetuity. How does the State anticipate maintaining a diverse portfolio? Especially given the requirement that it either gets fair market value for that diversity or is forced to develop at potentially inappropriate times. (SC-68.15)
- What type of market analysis will the State conduct before allowing development of State lands. The State should ensure that any development that is allowed on State lands is appropriate and will generate income in the long-term. Relying on a developer to make these decisions is abdicating the trust responsibility. The State is the only one in such a transaction who has the best interest of the trust in mind. The State should also do its homework before it allows developers to erect permanent structures that the State is ultimately responsible for on State lands. (SC-68.16)
- The State should spell out who is responsible for paying taxes on the property and what those taxes consist of. (SC-68.17)
- How will the State analyze the financial capability, solvency and history of developers and/or lessees? When a new partnership is formed the State should analyze the financial solvency of each of the principles. It should not assume that because it is a new entity that it has no information to analyze. How will the State verify the financial records provided by the developer/ lessee? (SC-68.19)
- How will the State structure leases? What will the term be? How will they increase over time? When will they be renewed? What interest does the original lessee have

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in the renewal process? (SC-68.20)

- All properties should be subject to independent third party appraisals. In house appraisals by the State are useful and have a purpose but the State should verify its calculations using outside professionals. In addition, all comparisons for appraisal purposes should be within the same immediate geographic area and market. Under no circumstances should the State use properties more than 5 miles from the property. (SC-68.21)
- How will the State avoid liability issues associated with some types of potentially hazardous waste generating activities such as gas stations, landfills, dry cleaners, etc? The State should develop a clear system for bonding users/ developers of State lands and a system of increasing bonds over time as more information becomes available. The State should have the ability to increase a bond at any time during the lease. It should not have to wait for lease renewals or periodic reviews. (SC-68.22)
- The State must ensure that each alternative considered is fiscally prudent and the State must fully disclose the costs associated with implementation. For example, an alternative that calls for aggressive development has costs associated with noxious weed control and likely with loss of productivity of the site over time. What about costs to local communities caused by sprawl? These costs must be fully disclosed and objectively analyzed. In some instances, the most prudent path may be one where development does not occur because the long-term economic and social costs do not outweigh purported short-term benefits. While we understand the State is somewhat constrained in their analysis, we believe that this programmatic EIS would greatly benefit from an independent analysis by economist(s), sociologist(s), planner(s), and wildlife biologist(s). (SC-68.23)
- How will the State decide the present value of property versus the value of that same property in 10 or 20 years? Especially for high end residential development? The state needs to look at the overall portfolio and balance the need for some commercial development now versus some set aside open space that will be more valuable for development in the future. (SC-68.24)
- The State has no discussion about management costs or how they will fit into the decision making process. For example, the State of Washington in its plan said that "certain assets have attractive rates of return, but when management costs are considered, the returns are significantly diminished. Life cycle management cost can also significantly affect the net return of a given investment. The financial analysis of alternative investments should include these costs." Montana should incorporate this idea into its decision making process. Managing property costs the State and the trust. That should be included in the calculation of cost and benefit of development. (SC-68.25)
- Where is DNRC's budget to actively and aggressively market these lands and conduct the necessary analysis required under state laws? (SC-69.7)
- Since the fluctuation in market values demands that each parcel of land, or portfolio, is under a constant process of reevaluation, the difficulty is that with more than five million acres tinder DNRC management becomes a huge project. In fact, the task for reclassification on a continual basis is so huge that the Land Board cannot adequately supervise each portfolio. In addition, the public, or lessee, has no way of knowing the status of economic value of each parcel portfolio at any given time. Then renewal of leases, for instance, becomes a time-consuming process. And this is more so when there is a public conflict pertaining to the meaning of "long term productivity" of each portfolio. (SC-72.4)

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- The idea of maximizing "the greatest monetary return" for each portfolio might be in conflict with other values more important to the people of Montana. If economic value becomes the priority, the DNRC then must expect public opposition for each parcel of land. Especially if the public is unaware that a certain parcel of land has been reclassified for special uses. Litigation will be the result each time changes or reclassification of land values for the "greatest monetary return" without informing the public. This can be an expensive burden for taxpayers. (SC-72.6)
- The proposal fails to consider the economic viability of development. The DNRC is obligated to manage for economic viability in long term. The agency cannot carry out this mandate without developing a plan for managing the trust assets, developing a framework for evaluation of the highest and best use, designing an economic model for evaluating investment alternatives, and developing a system for comparing actual and expected economic performance of investments and assets. THIS ANALYSIS IS ESSENTIAL. IT IS THE FOUNDATION FOR SOUND FISCAL MANAGEMENT. (SC-78.5)
- The original legal mandate of the lands whose management is in question in this plan is to support the public schools by the management of those lands. This is now being interpreted as justifying a policy to "increase" the revenue and "to capture increased land value" by "appropriate special uses" (Issue 1). Are there also increased costs, risks, and liabilities that are part of this effort? Are the costs to local citizens and governments created by a State action being taken into account? Are all these costs being figured in when the "increase" and "capture" are being figured? (SC-70.6)

Historic:

- We urge you to consider the historic aspects of the land, such as historic sites and trails and their long-term value to Montana. (SC-66.3, SC-83.3)
- Historic review should include review of community historic records, patterns of local built environment, and local land use plans, if any. (SC-67.3)

Cultural & Aesthetic:

- I understand that DNRC has a fairly progressive policy of prohibiting ORVs except on established roads. Is it possible to carry this one step further and set aside some old-growth and other pristine areas that, although they don't produce revenue directly (like cutting trees), add value in their very existence? (SC-7)
- The land suitablility analysis should consider natural history, historic and cultural aspects of a parcel, not marketing considerations as listed in Section 2.3.4 of the proposal. Natural history considerations should include slopes, soils, bedrock, ground water, streams, air sheds, wetlands, geologic hazards, portential wildlife habitat disruptions on and off site. (SC-67.2)
- Cultural considerations should be especially cognizant of Native American sites. Those sites may be far removed from reservations. Make advance consultation with tribal preservation or cultural offices an established, routine and required part of your review process. (SC-67.4)

Physical Environment:

General

- Maintain environmental quality of land (SC-15.5)
- Destructive uses – RV's, horses, logging in eastern Montana (SC-15.7)
- Ensure that long-term ecological impacts are considered for proposed developments (SC-33.3)

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• How open spaces, natural areas (created by the Natural Areas Act), recreation, and public use areas are handled to benefit the trust without destroying, damaging, developing, or leasing/licensing them for short-term financial gain or incompatible uses (SC-26.1) • Consider and ensure that development is in the best interest of the community and environment by addressing the ecological impact of development (effects on wildlife, water and air quality) as well as the impacts to local communities (sprawl, traffic and congestion) (SC-31.1, SC-32.1, SC-36.1, SC-38.1, SC-48.1, SC-41.3. SC-42.1, SC-42.4, SC-44.4, SC-46.3, SC-54.5, SC-56.3, SC-57.1, SC-64.2, SC-80.7) • Identify ecologically sensitive lands and prioritize those lands for protection. For example, lands critical for winter range, adjacent to sensitive fisheries, and imminently threatened by development should be protected (SC-31.6, SC-32.6, SC-38.6, SC-39.7, SC-40.5, SC-41.6, SC-42.3, SC-46.5, SC-54.7, SC-56.7, SC-57.1 and SC-57.3, SC-64.1, SC-65.4, SC-80.4) • How can the conflicting objectives of natural resource protection and income maximization be resolved? (SC-67.1) • Existing special uses and trust lands appropriate for special uses should be mapped. (SC-67.8) • To develop a plan for managing various lands, it would seem to me necessary to inventory what you have. Such an inventory would include at least a description of the location, nature, and current function(s), of the land areas involved, and in each case a characterization of the land's relation to surrounding lands and land-uses, of the way in which it is currently integrated into a context and is currently functioning in relation to its context. In particular, I think of ecological features of the land, which would be broader than any single parcel or set of parcels (does the land have a role in a larger natural area?), and of the socio-economic nature of surrounding land-uses (are those uses dominantly agricultural, or residential, or ... ?). Unless the plan is simply a reaction-guiding document, and not pro-active as a management plan can and should be, a good inventory would seem essential at the start. But I see no sign of it in the present proposal. (SC-70.1) • We are particularly concerned with the provisions in the proposed alternative for extensive commercial and residential development of school trust lands. The ecological impacts of developing structures on state trust lands should be thoroughly considered. Converting wild lands to residencies represents a long-term commitment of the resources of wild ecosystems and loss of habitat. The long-term ecological and economic impacts of permitting residential and commercial development must be thoroughly considered. (SC-62.5 • We are concerned that allowing for development may result in the DNRC incurring substantial ecological and economic costs associated with maintaining roads to the structures. Roads often have devastating impacts on water quality and fish habitat by increasing landslides, erosion, and siltation of streams. Roads also fragment forests and degrade or eliminate habitat for species that depend on remote landscapes, such as grizzly bears, wolves, and other large, wide-ranging predators (Trombulak and Frissel 2000). The habitat fragmentation, erosion, and sediment transport associated with roads is a major threat to the integrity of our forest ecosystems. (SC-62.10) • The State should require all landscaping on State lands to be energy and water efficient. Attractive xeriscape landscapes should be required. No or limited watering systems should be allowed. If the State has to take over the property, it should not

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have to worry about freezing water lines, dying parched landscapes and water and energy costs. (SC-68.27)

- The State should require all buildings to be energy and water efficient. The State should require the use of compact florescent lights, low flow water systems, an R-value of 30 or above for building materials, energy efficient windows, solar heating, and low pressure sodium outdoor lighting. The State should encourage innovative designs that maximize energy efficiency. The State should prohibit inefficient building materials, electric heating systems, and inefficient outdoor lighting like mercury vapor lighting or high-pressure sodium. All outdoor lighting should be shielded. (SC-68.28)
- All potentially developable properties should be evaluated for environmental constraints and any impacts should be eliminated or minimized. For example, the State should look at: the fluctuations in the water table over the year and in wet and dry years; the impacts from potential uses of the parcel on the quality and quantity of ground and surface waters; the impacts of the use of water on fisheries and wildlife; the air quality of the area and ways to minimize impacts on nearby residents and the air shed; ways to minimize the impacts of noise on residents and wildlife in the area; and ways to minimize the impacts of associated odors from the development. (SC-68.30)
- The State could save scarce resources by doing up-front analysis of properties. The State of Washington said in its plan that "environmental analysis of properties before they are formally identified as transition lands leads to environmentally sensitive and cost effective allocation decision, while implementing the program goals.... Identifying and evaluating the environmental elements and the natural resource capabilities on potential transition lands aids the department in determining a range of suitable uses for the land." This makes a tremendous amount of sense fiscally, environmentally and socially and the State should incorporate the idea into its evaluation of parcels. (SC-68.35)

Air Quality:

- All roads on lands developed for residential and commercial use should be paved to decrease dust. (SC-68.31)

Water Quality:

- Development should be prohibited from using septic and well systems. All development should be required to hook into city water and sewer. Variances should be allowed only in exceptional circumstances. If there is no city water and sewer or the parcel is too far from the community then it is probably inappropriate to develop at that time. The State should either conduct or require the developer to conduct an analysis in the extension and adequacy of water and sewer systems that will service the area. The State of Washington recognized that most property that should and would be developed had access to sewer and water. It stated in its plan that urban lands are "...those areas which within ten years are expected to be intensively used for locations of buildings, structures, and usually have urban governmental services." (Emphasis added.) SC-68.34)

Agricultural Land:

- I strongly favor grazing leases (SC-8.3)
- We are losing high producing farm and rangeland to developments and recreational projects which may bring in more money but only make us more dependent on other countries to feed us. We all need to take a long hard look at what land will be producing food for our future generations (SC-50)
- I recommend putting in place guidelines to protect grazing and agricultural leases

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from recreational organizations with grant money as we cannot compete on the same level when it comes to the competitive bid process. (SC-73)

Forest:

- Maintain Old Growth Forests (SC-16.1)
- Prioritize ecologically sensitive lands for protection, especially those that are critically important for wildlife uses and those of unique recreation value (SC-33.2)
- The EIS should thoroughly consider the potential impact to old growth of the proposed special use plan. Old growth is an ecosystem state rather than a state of individual trees. Those species that are dependent oil old growth ecosystems are primarily dependent oil old growth characteristics rather than the presence of large trees. These old growth characteristics include high levels of age class diversity and structural complexity, abundant snags, high levels of soil nutrients, and a rich understory of shade tolerant species. The presence of old trees generally signifies a relatively undisturbed ecosystem. As the DNRC is currently in the process of revising its old growth definition. Forests possessing old growth attributes should not be disturbed until the land board addresses the old-growth requirements of the 1996 State Forest Land Management Plan. All stands within tile project area must be compared to the Green et al. definition of old-growth. No logging should occur in stands meeting the Green et al. definition. As the DNRC's old growth technical review committee's report suggests that development of all old-growth network is essential, the DNRC must spatially consider the potential importance of old growth and mature stands in tile project area. (SC-62.11)
- Please provide a map that identifies state trust lands that could qualify for a 'Special Use' permit and also meet the green et al. definition of old growth forest. (SC-63.6)
- How will this programmatic process affect the retention of old growth forests on state trust lands? (SC-63.7)

Weeds:

- Weed control (SC-15.6, SC-25)
- Weed management should be an integral part of this plan. A partnership needs to be established between the Montana Weed Control Association and DNRC to develop a weed management plan to be implemented on all school trust lands. (SC-30)
- Information on the management of noxious weeds should be a part of the criteria in the plan (SC-55)
- Noxious weeds should be addressed in program goals, objectives, strategies, criteria and processes (SC-59)
- How will the State manage weeds on these parcels? How will it prevent noxious weed infestations? What will it do if one occurs? The State should have a system whereby it imposes fines on lessees who fail to control weeds. And the fine should be sufficient to discourage poor weed management. (SC-68.26)

Wildlife Habitat and Open Space:

- No net loss for wildlife habitat (SC-11.2)
- Maintain wildlife habitat (SC-16.2)
- The Initial Proposal includes the phrase "provided that the trust receives fair market value of the management rights forfeited by DNRC" in considering wildlife habitat and open space. Flexibility should be maintained by DNRC in both considerations. While direct monetary value may not accrue to the trust in every instance, there is immeasurable value in maintaining and promoting wildlife habitat and open space for

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students, communities and all of Montana. This issue needs further review. (SC-74.2)

- I was pleased to see that open space is one of the existing special use categories. We encourage the state to examine the use of conservation easements and other tools to retain state land as open space as identified in your preliminary program (SC-66.2)
- We are particularly concerned with the potential fragmentation and disruption of biological corridors associated with special uses including development and motorized recreation. Impacts to fragmentation and the functionality of biological corridors of the already heavily fragmented state trust lands should be a focus of the analysis. Habitat fragmentation may result in smaller and more isolated wildlife populations, particularly for species such as Grizzly Bears with demanding habitat needs. Smaller populations are more vulnerable to local extinction, due to stochastic events (Gilpin and Soule 1986). Smaller Populations are also more susceptible to the negative effects of inbreeding depression. Hence, maintaining landscape connectivity is essential to allowing for the replenishing of populations and expansion of the gene pool (Noss 1983, 1987. 1992; Noss and Harris 1986.- Craighead and Vyse 1995: Paetkau et al. 1997, Beir 1993). Fragmentation may substantially alter the microclimate of forests edges as well as interiors (i.e. radiation, wind, and water fluxes). The following fragment parameters determine the degree to which this augmented isolation will affect wildlife populations and ecosystem properties: remnant size and shape, time since isolation, distance from other remnants or an unfragmented block, connectivity, nature of the surrounding habitat (dissimilarity between remnant and surrounding habitat) (Saunders et al. 1991). (SC-62.6)
- The initial proposal states: “Lands that possess attributes of value to wildlife for forage, reproduction, and/or security. On trust lands with unique wildlife habitat values, DNRC may defer management activities to protect wildlife habitat, provided that the trust receives the fair market value of the rights forfeited by DNRC. Examples of mechanisms to secure interests of unique wildlife habitat could include special leases or conservation licenses.” We request explanation of the origin of these statements regarding wildlife habitat. While the statement regarding fair market value appears to result from the bill recently passed by the Montana legislature (SB 354), we request that the DNRC clarify this. The DNRC is required to abide by federal laws, including the endangered species act in the management of state trust land. Deferral of lands for wildlife is necessary to meet federal laws and to maximize public benefit of school trust lands as discussed above.
- Please detail the avenues available in the proposal to conserve state lands for wildlife habitat and ecosystem services. (SC-63.4)
- Please provide a map of state trust lands that could qualify for a 'Special Use' permit that are sensitive wildlife habitat core areas or corridors. (SC-63.5)

Fisheries:

- What is the DNRC position on the poisoning of 1-1/2 miles of Carpenter Creek under the experiment funded by Turner’s endangered species fund? Montana’s wild fisheries will be destroyed. (SC-22.6)

TLMD Management Issues:

- Sale of lands (SC-8.1)
- Conservation leases (SC-8.2)
- Stop trading state land just because it is inaccessible (SC-15.8)

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• Do not sell any state lands (SC-18, SC-22.2)
• Trust lands do not have to be leased, sold or otherwise “disposed of” for our children’s sake. The state government owes our children an education, and it should not be at the expense of the land in their future. We are taking from them to give to them and that makes no sense. (SC-76.1)
• One of the greatest challenges is to insure that special interests do not derail efforts to secure the greatest advantage to the trust beneficiaries. We should consider emphasizing those parts of the program where competitive processes are possible, and avoid as much as possible mechanisms where an open market is stifled. (SC-23.3)
• I don’t support proposals that would promote an increase in permanent disposition of trust lands (permanent conservation easements, purchase/sale of development rights). I suggest we consider these permanent dispositions differently than other special uses. These uses include irreversible and irretrievable commitments of resources and should be approved by the Land Board. (SC-23.9)
• Do not sell any land unless it would earn more money. When you sell land, the money is spent and the land is gone forever. (SC-82.1)
• Who will be responsible for the maintenance on properties and what happens if the lessee fails to do so? (SC-68.33)
• Use of the land should earn the most income possible and comply with local land planning and the highest environmental standards. (SC-82.2)
• How did the Board of Regents get away with selling state lands? (SC-22.2)
• Be sure that trades or transfers of state land are equitable (SC-18)
• Sales should be kept to a minimum and the less development the better – there is plenty of private land for commercial things (SC-29.3)
• A high priority should be conservation easements, greenbelt areas and land close to towns should be used as open space and/or environmental and wildlife areas that are available for study by school children (SC-29.2)
• Inventory, analyze and prioritize those lands most suitable for commercial or residential development, i.e. those lands adjacent to urban areas that can use existing infrastructure. (SC-31.2, SC-32.2, SC-34.1, SC-36.2, SC-38.2, SC-39.1, SC-40.2, SC-41.1, SC-42.1, SC-46.1, SC-54.1, SC-56.5, SC-64.2, SC-65.3, SC-80.5)
• Realization of greatest revenues from those lands and projects which are presently developed (SC-58.1)
• While we support pursuing conservation easements oil DNRC lands, we oppose many of the special uses pursued by the proposed alternatives. The DNRC should not commit resources to promoting development of DNRC lands. (SC-62.9)
• How will the state avoid allowing companies to build buildings that have little to no release value? How will the state avoid a situation that has occurred across the state with the former Ernst stores that have stood empty for years? (SC-68.13)
• The State should develop clear criteria for who controls, and under what circumstances they control, activities on the property. There will be inevitable confusion on parcels of property where the sublessee is controlled by a master lessee, the State and the local government. To avoid conflict the State should determine up-front who has jurisdiction and when. (SC-68.40)
• If state land occurs in an area that has little or no planning nor zoning, then the State should engage in a neighborhood planning process. However, the State could easily avoid the situation that occurred in Kalispell. Instead of doing the neighborhood plan

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itself, it should engage the help of the local government and commit itself up-front to complying with the Plan that the local government designs. If the State fails to engage in this level of community planning then it will be faced with suspicion by the community and the local government. (SC-68.41)

- The State should avoid getting involved in single-family residential development. However, there may be sections of state lands that are most appropriate for residential use. The State should develop a system whereby land that is most appropriate for single-family residential use can be traded for other lands of equal or greater value. (SC-68.49)
- Are school trust lands also to be managed for the benefit of the public? (SC-68.56)
- How will the agency ensure that the proposed development benefits the local community? (SC-78.3)
- The State has not indicated how it will allocate scarce resources in the event of competing demands. The State must establish some way to prioritize projects. For example, if there are 6 people who approach the State at the same time and want to develop parcels of land across the state, but the State does not have the ability to move forward with each proposal simultaneously, how will the State chose among projects. Some type of relative prioritization scheme should be established before this type of conflict occurs. Perhaps the State should adopt a system like the state of Washington did in which in 1968 and again in 1974, it developed a Resource Allocation Plan in which it attempted to project future uses of trust land. It designated land Current Urban, Urban 1980 and Urban 2000. Such a designation scheme would help the State prioritize properties for development, allocate scarce resources, and assist in planning and decision making. (SC-68.61)
- In contrast to the inevitable conflicts with local plans and competition with private businesses that aggressive urbanizing of state trust lands will create, DNRC can manage trust lands to benefit local governments in a number of instances. Local governments often have a difficult time finding property that is environmentally and politically suitable for such essential community purposes as water and sewer treatment plants, or for landfill or solid waste transfer stations. If a tract of state trust land is located in a suitable area, DNRC can greatly benefit a community struggling to locate a necessary facility by trading or leasing a parcel to the community. Also, one of the biggest problems in Montana communities, especially growing communities, is providing affordable housing for low and moderate income families. The shortage of affordable housing exists because of strong markets for constructing high-end housing and/or high market prices for land. On trust lands that may be suitably located, DNRC could provide a genuine public good by working with local officials and builders to devise plans and arrangements for constructing lower-cost, affordable housing. Such thoughtful, coordinated use of state trust lands for local benefit would be in stark contrast to profit-driven urban development that can thwart local objectives. (SC-81.6)
- Should DNRC initiate an urban development proposal, or should DNRC wait for a community to propose development of trust land? (SC-81.12)

Technical and/or Editorial Comments:

- The Montana Audubon and Flathead Audubon are currently negotiating a lease/license on the only state natural area. We are also aware of the back door attempt by Bill Crismore and Cary Hegreberg to eliminate the natural area. They are very closely associated with Missoula and DNRC, and this scoping looks like a smoke screen to divert attention from that issue. Maybe not, but it looks that way to

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me. Special uses on natural areas are considerably different than on cabin sites or grazing leases. (SC-13)

- I would like some specific and real examples of present and future activities on school trust lands which may or may not occur based on your EIS process. (SC-19)
- I see this process as a great opportunity to more effectively manage school trust land for the benefit of the beneficiaries and the citizens of Montana. (SC-23.1)
- I am concerned we take full advantage of the opportunity to be creative and to chart new direction for special uses. I encourage you to fully utilize our existing staff to develop creative ideas. (SC-23.2)
- There may be a need to differentiate management of trust lands vs. other state land – such as the bed of navigable waterways or administrative sites. (SC-23.4)
- I wish greater consideration would be given to compatible mixtures of uses. I don't have a good suggestion in this regard, but I do know that we manage special uses on timberland and we manage timber on special use lands. Each programmatic plan needs to recognize and accommodate other programmatic plans. They are not entities unto themselves. (SC-23.8)
- There are two primary pressures that could lead to unwise land use choices:
    - One is a continuation of pressures to develop ever dwindling land in Western Montana
    - The other is the politically based scramble to fund state programs by realigning state income sources (SC-33.1)
- Thanks for doing this (SC-28)
- Clearly state that full market value is not the only consideration when determining management plans for lands for open space, recreation, wildlife and aesthetics (SC-31.8, SC-32.8, SC-34.5, SC-38.7, SC-39.3, SC-40.7, SC-41.7, SC-44.1, SC-46.7, SC-54.6, SC-56.2, SC-57.2, SC-64.5, SC-65.7, SC-80.3)
- One of the greatest values of these lands into the future is not short-term monetary return but the open space and ecological values that are increasingly threatened by commercial uses and development. (SC-35.1)
- Special uses for wildlife habitat, open space and water and soil conservation should receive high priority consideration in the planning (SC-35.2)
- Preservation of natural, open spaces (SC-58.2)
- Would like to see more integration of policy among state, federal and private lands regarding OHV and recreational use (SC-37)
- Development of school trust lands is not always in the best interest of the community (due to increased traffic, sprawl and congestion) or the environment because of the effects on wildlife, water and air quality. (SC-39.4)
- I have three grandchildren so I hope that while you are getting fair market value for those 5.2 million acres, you consider the aesthetic value as well. Once the natural vegetation is destroyed, my grandchildren will never get to enjoy that land no matter how much money DNRC gains (SC-49)
- My concern is that in assigning a dollar value to these 5.2 million acres, the government will not take into consideration the real value which has nothing to do with money. Real value supports all of life physically, emotionally and spiritually and does not have a dollar value. Please consider the effects on at least seven generations in making decisions (SC-51)
- I am personally uneasy with the State expanding their role beyond natural resources management. In our current democratic system, capital is, for the most part, held

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and managed in the private sector. The public sector limits itself to regulation of those activities for the public health, safety and welfare. The state becomes involved in capital matters to the extent of market failure. There is no market failure demonstrated to justify provision of residential, commercial and industrial uses on trust land. Becoming involved in land development constitutes unfair competition to private sector individual taxpayers. The goal to maximize revenues could more appropriately be provided through other methods of diversification (SC-52)

- I am very concerned about changes that could be harmful to our towns and quality of life (SC-57.7)
- Balance carefully the necessity for increased revenue against the irreplaceable value of Montana's open lands – especially those situated along rivers. Not only do we need to preserve them for the sake of their natural inhabitants, but we need them for the peace and tranquility they provide for our souls. (SC-58.3)
- Define land banking, what the objectives are, and how local communities would benefit. (SC-67.7)
- FWP believes balancing the trust revenue mandate with the insurance of long-term productivity of the land is a critical concept. A clear definition of long-term is important, as it will likely drive the preferred alternative. Many special uses could generate increased income for the trust but may adversely impact the long-term health of natural resources and surrounding the state parcel. The preferred management program should benefit the trust and citizens of Montana. (SC-75.2)
- In the most general terms we understand DNRC's desire to improve the efficiency of the decision making process for Special Use Permits. It is important to AWR that any changes in the special use permit issuing process will work to conserve Montana's valuable natural resources. Fundamentally, a plan that streamlines the analysis process while simultaneously aiming to increase revenue stands to have a negative impact on these resources. At this point it is difficult to determine how the proposed management plan would make the permitting process more efficient. The preliminary proposal seemed to emphasize commercial and residential development with a strong emphasis to maximizing profit. If this is the intention of the programmatic approach, the Alliance is wholly opposed to it. (SC-63.2)
- DNRC's land use decisions will significantly and permanently impact how many communities develop in the future, and whether or not a community: 1) retains its historic character, vibrant downtowns, and local businesses, 3) maintains its quality of life, 4) efficiently uses local land, water, taxes, and other resources, and 5) insures that transportation and affordable housing are available to all of a community's residents. (SC-65.1)
- All decisions for whether or not to develop trust lands for commercial, industrial, or residential development should consider the following criteria: Proximity to existing infrastructure and urban areas; Impact on transportation congestion and access for non-automotive transportation; Cost of providing local services including but not limited to schools and busing, emergency services, and police; Impacts on water quality and quantity including both surface and ground waters; Impacts on air quality; Impacts on wildlife habitat; Existing agricultural land classification, usage, and potential agricultural use; Proximity to the wild land-urban interface and 100 and 500 year flood plains; Cumulative community impacts including community services, schools, infrastructure, traffic, etc. (SC-65.5)
- It might be helpful if the EIS includes some succinct definitions. At a minimum the following terms should be defined: land banking, trust management portfolio, portfolio

COMMENT

management functions, purchase and transfer of development rights, short-term and long-term (as used on page 37 of the scoping document), subsurface water rights (page 40). (SC-68.59)

- Some examples of DNRC development activities (both successes and failures) would be instructive. (SC-68.60)
- These lands are determined to be sold or exchanged we believe the first opportunity should be to the federal government or other conservation buyer to ensure these lands remain in public ownership and the wildlife habitat, water quality and other values are protected. (SC-69.10)
- Almost invariably, when private land developers or public land managers pursue a single-minded goal of maximizing revenues or profits, the resulting development undermines, diminishes and conflicts with other community values or public interests. Owners of private property in Montana enjoy certain legal and constitutional rights, and local government struggles to balance protecting private property rights with protecting public values. However, those same legal and constitutional property rights do not attend to public lands, and the public land managing agency must be held to a higher level of sensitivity to community values and needs. It is simply wrong for a government agency, such as DNRC, to develop the public lands within its charge in any way that would injure local citizens and communities or diminish or conflict with local plans, interests and assets. (SC-81.1)
- In nearly all situations, trust lands considered for urban development will be located on the outskirts of an existing community. Generally, urban/suburban development on the outskirts of an existing community will exacerbate suburban sprawl - increasing suburban traffic, creating strip development, requiring costly extension of public services, weakening central business districts by pulling downtown business to fringe-area commercial development. All of these results adversely impact communities and local citizens. No matter how well an urban development might be designed on a tract of trust lands, if the location is improper, or is in conflict with local plans, the effect can be adverse. (SC-81.4)
- DNRC proudly points to its proposal on Section 36 north of Kalispell, but that case is a classic example of development on the fringe of a city which likely will deteriorate local values and assets. The DNRC proposal will increase the notorious traffic congestion on Highway 93 and will undermine the vitality of the Kalispell downtown, which Kalispell has worked so hard to develop and cultivate. Kalispell has an excessive amount of commercial and industrial lands allocated within the planning area, and the DNRC proposed development will only worsen that problem. Even though local officials amended the local comprehensive plans to accommodate the DNRC proposed development, the department has not obtained subdivision approval or zoning approval - claiming exemption from local zoning and subdivision regulations as a state agency. It took a lawsuit by Kalispell citizens to halt DNRC's development proposal that would conflict with and harm local community objectives. (SC-81.5)
- Local government land use planning and management in Montana not only is imperfect, often it is simply ineffective. But it works as well as it does because local elected officials - accountable to local voters - make the decisions. DNRC's unelected employees have no business making land use decisions that can so impact local communities and residents. Although the members of the State Land Board are elected on a state-wide basis, those persons do not have the commitment or accountability to local residents that local elected officials usually have. (SC-81.8)

COMMENT

- Overall, the proposal for the management plan has considerable merit in several regards. Some plan is needed, some overall vision and some strategies for achieving the end for which the lands were originally given. The willingness expressed in this plan-proposal to attempt to achieve the end by working closely with local government agencies and the people of the affected area is very commendable. But I think that the particular vision that is presented in the proposal in its current form is too narrow in its focusing in on revenue and monetary return as the meaning of "support" for the schools. And I find troubling the fact that while environmental concerns are mentioned the tone of the document indicates that they will not be given much weight in fact (they will be 'considered' indeed, and if some law forces conservation or pollution control or environmentally protective measures they will of course be done, but...). I am very sorry to hear that, because I think education and the environment have a close and mutually reinforcing connection. (SC-70.10)

Appendix D:

- In Appendix D - Course Filter Process the Department outlines the process for determining classification of lands. This process needs significant clarification. Generally, we are concerned that there is not much weight given to the issue of social acceptability/ level of controversy of a given project. More specifically we have the following questions:
    - How were the relative weights established?
    - Why is Tier II property lumping "lands with long-term" potential with lands with “no potential for development"? These are, or should be, two very different outcomes.
    - Why are water rights necessarily critical for development? It seems that the best case scenario would be if a developer could hook into city water and sewer and the existing system has the capacity to service the proposal.
    - There may be qualitative issues that are important but are not factored into this analysis.
    - Why are environmental laws impacting the property considered such a huge detriment? Giving this much weight to this factor does not make sense. There could be a situation in which a parcel is located in an air shed that limits the quantity of a pollutant that can be emitted. But that does not mean that the weighting should be skewed against developing that parcel. There could easily be less polluting projects or alternative ways of designing a project that would be superior and less polluting.
    - Under "LEGALLY PERMISSIBLE" "Leases," what does it means when it says "No lease 1; lease not precluding alternative use 2?"
    - Under "Encumbrances," what would cause the ranking of a 2 versus a 4?
    - Under "PHYSICALLY POSSIBLE" "Infrastructure" why does "more than 5 units or one commercial" rank lower than "less than 5 units or 1 commercial"? Why does developing a septic rank lower than developing a treatment plant? It might be that for a large development, developing a treatment plant might be far preferable environmentally than allowing septic. What does "sewer developable" mean? Does this mean the State can hook into city sewer? The State should analyze whether the city has the capacity to handle the additional burden.
    - Under "PHYSICALLY POSSIBLE" "Contaminated /Hazardous Sites /Landfills" it might be worth the State's effort to encourage thorough clean-up and subsequent development of contaminated sites. The State and federal governments have

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consistently encouraged brownfield developments. Perhaps this should be considered in the ranking criteria?

  - Under "PHYSICALLY POSSIBLE" "Water Availability" the state should consider the capacity of the city water system before it simply ranks it so low.
  - Under "PHYSICALLY POSSIBLE" "Geologic Features" will the state also consider the variability of the water table? Will the State only analyze a snapshot in time or will it consider differences that occur between wet and dry years, spring and fall?
  - Under "PHYSICALLY POSSIBLE" "Lease Improvement" what does the state consider improvements?
  - Under "PHYSICALLY POSSIBLE" "Floodplains" the state should identify which floodplain is appropriate. The State should prohibit all development in the 100-year floodplain at a minimum and the 500-year floodplain in most circumstances.
  - How does "Administrative Factors to Consider" fit into the analysis? What do positive and negative ratings mean? Is MEPA positive, negative or no impact? This entire page doesn't make sense.
  - How does the flow chart on page 38 fit in with the flow chart on page 50? Are these processes sequential? Concurrent? Integrated? Or independent? (SC-68.42)
- Once the State completes its analysis described in Appendix D, it should designate parcels for development and keep track of those changes in a database where the public can access the information. Washington State's plan says that it will "designate suitable trust land as urban land at intervals not greater than once every two years." The State should review designated or reclassified land periodically or as new information becomes available. Is there a system for changing a particular classification? Citizens should be allowed to petition and ask for a change in classification. The Board should then be responsible for changing the classification. (SC-68.45)

Appendix J

- Appendix J. is a dangerous matrix, as it vastly oversimplifies the location suitability of different types of land uses. It may be for illustration purposes only at this stage, but it is exactly the type of evaluation tool that can be inadvertently abused. As one example: There are many rural areas where single-family residential development would be totally inappropriate. (SC-47.7)

Comments Received from TLMD Personnel

Personnel/Department

- Diverse, well-trained (and paid) staff is capable of dealing with ongoing changes and challenges of land management
- Increase skills of our own staff
- Unifies Divisions and Bureaus
- Better staffed, better trained organization
- Next touchy/feely session at Lone Mountain Ranch – they cover per diem – i.e. we start getting paid for production/worth
- Adequate funding and FTE
- Implementation strategies and organizational skills can transfer to other programs
- DNRC provides leadership in planning and development in the state "flagship"
- Successful implementation would increase morale across the Division
- Clear direction to a "haphazard" program

Trust

- The obvious; Trust income will be increased
- Maximize Trust revenue while contributing to sustainable communities and natural resources
- Legitimizes trust mandate with public
- Increased income to the trusts. Increase land area.
- Meeting goal of the trust, making money while protecting environmental impacts
- Show me the money (Trust)
- Increase Trust assets and/or value
- Increased benefit to trust through responsible management
- Contribute to the Department meeting Trust obligation
- Balanced portfolio provides the optimal long-term revenue for the Trust

Public Relations

- Bring a positive change to community
- Having alliances with county, city, legislative, etc. officials resulting in win/win situation
- Establish relationships/presence
- Increase working relationships between staff and other agencies
- Clear vision needed for public and staff
- Divert public opposition from other programs
- Improve relations with cooperators and public
    - Good results
    - Make visibility of Department positive
- Allay current fears and uncertainty
- DNRC viewed as a "good neighbor"
- Public believes DNRC doing the right thing

- Public understand what special uses do and how they generate income
- Build trust and support with public and strengthen partnerships within the local community, which leads to more and better opportunities
- Bring legislature along, so legal and policy structure would actually support income generation and development
- Able to successfully implement special uses and integrate our other programs with public and internal "buy-in"

Resources

- Trust land management is compatible with community development
- Looking at management of Trust lands as Trust land managers supporting each other
- Natural resources management opportunities maybe enhanced in growth areas due to effective local planning processes
- Decrease dependence on extractive resources
- Results in better planning for, and use of trust lands
- Rape and pillage does not happen
- Efficient use of resources to minimize impact of natural resources and maximize revenue for Trust
- Still manage resource base and maintain that value
- Achieve economies of scale. Big bang for small use of land
- Move forward – pay for existing non-authorized use – capture value taken advantage of by adjacent landowners

Economy

- We capture revenue opportunities by timely development with local community development. (Example: scattered sections north of Billings)
- Promoting statewide economic development
- Reduce risk to our asset base
- Generating jobs and improving local economies
- Spin off benefits include reduced individual property tax load, with an increase in total tax revenue
- Implementation results in compounding leverage economically
- Generate money for school system, make smarter kids lower
- Lower tuition rates
- Allows us to remove bad stewards from our asset base
- Diversify our asset base, while addressing changing needs in our communities/economies
- Diversify portfolio
- If plan is successful, increase success to other programs
- Market driven asset management programs
- Fully diversified/integrated asset management portfolio (Ag, timber, minerals, special uses)

Planning

- Poor planning (short term vision) reduces or eliminates management opportunities for multiple use or supplemental income from adjacent lands
- Models used could be inaccurate and could cause more risk
- Need to spend time to consider the projects and not (just dive into it). Good planning, good implementation
- No flexibility – plan needs to be flexible and change with the times
- When planning/implementation process is being driven by politics rather than the programmatic plan
- Because of previous statement (lack of expertise) end up with poor planning and project not followed through
- We cannot move too fast. Set reasonable expectations/goals
- There are so many test to be done, that we end up not accomplishing anything

Personnel

- Lack of training that prepares us adequately for negotiation with state and non state customers
- Polarization of bureaus and division staff
- Added workload
- Generate expertise and train staff
- Not having enough training – resources, time and training to bring program along
- Need same skills, training, etc as those we deal with (realtors, developers, lessees – like Lowe's)
- People in the field can not do what they think they are\
- Lack of expertise of staffing or lack of staffing (team visions)
- We may need more Tommy B's

Department

- Charge forward without adequate staffing and end up doing a haphazard job
- We have a good plan and vision but Department of Natural Resources (DNRC) lacks the protocols, policies and laws to efficiently accomplish the goals
- Alienation and loss of cultural values, extra workload without additional money
- Difficult to implement if employees/staff don't believe in plan
- No follow-through on expectations because of limitations on expertise and resources
- Current workload is high – decrease in productivity in existing programs with shifting emphasis
- Bureau will move forward without field
- Expecting people with full time jobs already to add this work without anything falling off plate. Not enough FTE to do the job

- How do we actually implement this with current resources? We can't implement the plan
- Focus of new/current resources to develop plan, but they aren't adequate to implement it.
- Integration with other programs is a goal, but actually may further alienate Bureaus by pushing this program
- Not enough monies in the FTE's
- Forestry Division interferes with program duties
- Additional work load with no additional Field FTE
- FTE's who do this work have disciplines that are not in this field = training
- We have to have implementation training for the statewide SU plan that means everybody at all levels must participate

Resources

- That a large percentage (unknown % = 10% too large?) of forest land will be subdivided for residential use
- Effective administration strategies are not implemented resulting in environmental and economic train wrecks
- Concerned about 60/20/10/10 – current Ag land already doesn't fit well – CRP now being lost to grazing. We will rape and pillage resource to get it into 20% Ag land. Current policy conflicts with vision.
- Displacement of cultural/historical/traditional uses
- Statewide priority setting associated with the 60/20/10/10 will likely "water-down" certain programs – example: move resources from "timber" to implement 1% to 10% move in special uses, while increasing timber at the same time from 9% to 10%
- Changing basic mission from natural resource management to real development
- With development comes a cost that may not be cost effective. ("Cost may outweigh benefit".)
- Lack of specialist input may require the special uses to contract for wildlife, soils, etc…currently contracting fund available.
- There is no money to develop those parcels
- We get hoodwinked with conservation
- Potential for competition with commercial, private sector and lessee's for high value parcels
- Easements and can not manage our lands in the future or have management limitations

Public/Community Relations

- The vision is significantly altered or squelched as a result of political influence
- Failure to maintain public support resulting in the demise of the program
- Agency buy-in and public perception
- High expectations from public and internally to produce results where we don't have the necessary expertise

- Legislative reluctance – lack of acceptance from legislature
- Not bringing everyone along with it – County Commissioners, legislators, resulting in conflict and not meeting their goals
- Potential to create information culture based on haves and have nots
- No buy-in by special interest groups
- Require a huge public relationship effort that includes local government, special interest groups, and all players

Economy/Trust

- Future trust land mangers are left with economic and environmental liabilities
- Alienation of traditional users of State Trust land
- Foregoing future revenue producing opportunities
- Reduction of short/long term revenue generation
- Not to fulfill mandate to generate maximum Trust revenue
- Solve the funding concerns of implementing this
- By going forward with the S.U vision we will increase the social political negative effect on maximum asset value

Training

- Adequate training. "I want to know what I'm supposed to do and how to do it".
- Train key staff in negotiation skills
- Increase people's skills and training with commitment to implement by Agency
- Provide appropriate training to maintain corporate culture

Public Relations

- Presentations of draft plans at MACO or similar organization to generate support
- Identify a relatively few low risk project and closely with communities to develop common goals to build confidence and partnerships
- Get buy-in – build constituency base with community leaders, legislators, etc
- Involve legislatures and communities at earliest opportunities
- Using public involvement (MEPA) process to make decisions regarding actions made by the Department will show that the public is choosing final decisions about state land
- Establish communication/involvement mechanisms with local government entities
- Partner with other agencies to meet their goals and ours
- Involve local community at all levels
- Work closely with local communities to develop common goals
- A good public information and participation program
- Educate public as to what we do

Planning

- Goals and objectives that fit allocated FTE and dollars
- A good inventory of current Trust assets and the value or constraints for management.
- Look at what's on our plate now and see if makes sense to keep doing or what to do to change that.
- Seek help from other states and learn from their success/failure
- Develop an asset management plan
- Investigate other successes
- Plan flexible enough to accommodate big picture issues, planning future and implement changes. We can be proactive
- *Plan that recognizes; raises visibility and if it's positive result could be good*
- *Improve relationships with cooperators, public, achieved positive employer growth*
- *Plan legitimizes land, public looks at state*
- "Out of box" thinking – flexibility in programs and thinking
- Inclusive process: 1) public; 2) local government
- Clearly defined outcomes, goals, objectives and rewards
- Establish economic successes as a base to build confidence as a Department, create partnerships and dissolve distrust
- Identify by various strategies that reduce administrating workload, provide opportunities to leverage one development to the next development
- Make our processes as transparent as possible to all (public, employees, politicians and wizards).
- Provide real guidance on how to implement the plan "on the ground".
- The strategy would identify needs and prioritize projects
- We are creative and innovative in planning and implementing "high end" developments
- Incorporate and exploit our investment in technology in our planning and implementation effort

Communication

- Effective administration communication (policies, etc) and personal communication (respect, listen, value, etc.)
- Good public participation process/ internal participation
- More face-to-face contact with LGU's (Planning offices, County Commissions, councils, etc)
- Solicit input from affected parties and track our responses
- Build consensus/support among all the players
- Good relationships/communications with all (Agencies, Interested Parties)
- Keep it simple!!!!
- Improve communication – empower field
- Establish communication/involvement mechanisms with local government entities

- Educate (Internal/External)
- Need to brief others
- Keep all interested parties in the loop at all phases
- The strategies that will foster the best outcomes would be information gathering and sharing with both internal and publics to create buy in and allow the process to move forward with trust resistance
- Create an information distribution system to get information to field and field information
- Communication with players, utilized best trained personnel for the job

Project Management

- Good project selection procedure/criteria
- Well thought out implementation tools
- Well thought out projections/expectations
- Prior to release of final E.I.S. develop a system for distribution and implementation of the E.I. S. to include mandatory orientation and training to those working in the program
- Prioritize projects
- Monitor implementation – working? Management expectations? Adjust
- Bring people on board with the proper expertise and experience
- Seek partnerships with developers both for projects and on a political basis
- Implementation plan will need to be completed enough to indicate “Go/No Go” before completion of PEIS
- Defined goals and ideas of projects of public prior to identify goals and ideas of Department
- Timelines, funding and Task Force in place to carry out plan
- First project have big probability of success
- Get in “buckle-up/shut-up” and learn from mistakes
- Early identification of projects that have a high chance of success
- External resources – consultants
- Develop reasonable goals/expectations based on current ideas and value that set the foundation for us to succeed. The expectations are the key to success and they must be developed at a small scale considering local values. Once developed, intense promotion of these expectations must be conveyed to public, other agencies, XXXX, legislators, etc prior to implementation. Once committed, follow through of these must be completed.
- Diligent evaluations of proposed exchanges that logically show conclusion to Helena
-

Funding

- Increase in qualified FTE or funding for contracted services
- Pay people what they’re worth
- Take advantage of good deals

- Funding mechanism/strategy developed from receipts
- Obtain funding
- Source of money for improvements
- Capture seed money for implementation emphasizing past success
- Try to get ahead of the curve and have adequate funding to take advantage of opportunities before other capitalize on the opportunity
- Have Bud lobby legislature for more money
- Have Bud lobby national legislature for money for specific programs available.
- Encourage public to lobby local legislators to support program with money
- Get ceiling XXXX raised to accommodate collecting a "special User XXX? Fee" to foster development of priority infrastructure. Go into next legislative session and request one million dollars seed money to kick it off. (Justify by successes, Lewis and Clark succss; Spring, Prairie and bypass; Hampton Inn in Great Falls, sale of lots in Billings, etc.)

Policy

- Develop agency policy and procedures that facilitate proposed actions but realize the need to retain flexibility
- Policy changes
- Supporting legislation, rules, policies
- Programmatic plan, policies and legislative support in place which support our vision
- Align: policies/procedures/rules/regulations/laws
- Policies and procedures in place before beginning
- Bureau Chiefs/Division Administrator and Director continue to identify policy evolution need and legislative support to meet objectives

Personnel

- Be flexible/adaptable/open-minded
- Have fun
- Attitude changes
- Attract these people from the private sector with comparable compensation
- Good honest communication within the organization with no hidden agenda

Management/Organizational

- Program Managers, Bureau Chiefs and Area Managers must involve affected people in their management decisions
- Visions must be supported by realistic implementation plans and adjusted to match approval and funding
- We have organizational flexibility to respond to markets
- Need core staff of specialists
- Dedicated discipline staffing

- Convert from an “all hands meeting” to an “all hands agency”
- Include strategy for orientation of new employees specific to the plan
- Open to all possibilities
- Contract private services to reduce workload
- Clear vision and direction
- Break down global vision and short-term goals start slowly
- All on the same page, continuity (state wide important)
- Provide incentives to other Bureaus for support
- Core staffing of specialists
- Dedicated staffing to minimize conflicting workload
- Administrative support of a common vision that clearly articulate a team or partnership relationship towards achieving objective for special uses
- We trust and respect each and act accordingly
- We foster a culture of appropriate risk taking
- All field staff to be committed to leadership decisions

Resources/Trust

- Each land office has technological support to get it done right
- Use money from the sale of conservation easements to purchase Plum Creek or other land
- Sole status vs. exchange status
- Address how to determine whether to sell, leese, easement
- Have we identified transitional lands?
- Evaluate deferred exchange lands with access, whether we have it or not
- Identify relatively few easily developed trusts (low risk)
- Enlist land trusts to run and fund projects that are mutually beneficial
- Availability of a source of money to improve entitlements on property

Appendix B

Population and Economic Conditions of DNRC Land Office Regions

Dr. Paul Polzin, Economist

May 2004

Introduction

This section presents summaries of the economic conditions in each of the DNRC Land Office Regions. Both long-term and short-term economic conditions are measured using several indicators. The Regional Economic Information System of the U.S. Bureau of Economic Analysis provided most of the data reported in the following sections. Data tables are provided for each DNRC Land Office Region with a state total shown in Table 1.

Economic Indicators.

Economic conditions in the land office regions were measured using three indicators; population, per capita income, and nonfarm labor income. These variables reflect different aspects of the local economy and together provide a comprehensive overview of general conditions.

Population measures the total number of persons in the area, which underlie the demand for housing, consumer goods, and other items.

Per capita income is equal to total personal income divided by population. It measures average income per person. Per capita income is an indicator of economic well-being. The greater per capita income the more goods and services the average resident can buy. Per capita income does not incorporate non-monetary incomes some Montanans claim to receive. Per capita income is reported in constant dollars to eliminate the effects of inflation.

Nonfarm labor income is a proxy for Gross Domestic Product (GDP), which is not estimated for counties or other local areas. Changes in nonfarm labor income measure the changes in GDP. Agriculture is excluded because its volatility masks trends elsewhere in the economy. The analysis does not ignore farms and ranches; they will be explicitly discussed in the DMRC Land Office regions where they are important, and agriculture is included as one of the basic industries. Nonfarm labor income is reported in constant dollars to eliminate the effects of inflation

DNRC Land Office Regions.

DNRC Land Office Regions are not true regional economies, but are multi-county areas created for administrative purposes. This means that certain relationships or factors that are thought important in specific local economies may not be well represented in multi-county data. For example, part-time residents are thought to be an important driver of economic conditions in certain areas of Flathead County and State Government is a major component of the economic base in the Helena area. (Swanson, Polzin) These factors, although significant for specific communities or counties, are relatively unimportant in multi-county DNRC Land Office Regions and will not be discussed in this section..

Basic Industries

Basic industry labor incomes are presented for each DNRC Land Office to characterize the region (e.g. agricultural or wood products orientation) and to explain the important trends in the economic indicators. Basic industries are those activities that primarily sell their products outside the area or are otherwise dependent on events outside the area. Basic industries inject new dollars into the economy that create additional income as they are spent and re-spent locally. Changes (either growth or decline) in the basic industries lead to further changes in the rest of the economy.

Labor income is presented for seven basic industries that are significant statewide. Agriculture is represented by two industries: agriculture and agricultural services and forestry. The first is the labor income earned directly by farmers and ranchers while the second represents activities closely tied to agriculture. The changing character of Montana agriculture away from production and toward associated activities is reflected in declines in agricultural labor income and growth in agricultural services. In western Montana, the increases in agricultural services and forestry were mostly due to growth the forestry category.

Mining consists of three components: coal mining; oil and gas extraction; and mineral and non-mineral extraction. Transportation includes railroads and trucking.

Manufacturing varies significantly from one part of Montana to another. In Western Montana, wood and paper products is the largest component. In Eastern and Central Montana, manufacturing includes the oil refineries in the Billings area, the high tech companies around Bozeman, and a variety of small manufacturers.

Nonresident travel is the tourism industry. These figures include persons visiting Montana for both business and pleasure, and include portions of several tourist-related industries. The estimates presented here were based on total nonresident spending provided by the Institute for Tourism and Recreation Research.

Federal Government labor income includes persons working for various agencies such as the USDA Forest Service, the Bureau of Land Management, and the U.S. Post Office. The land managers and other professionals earn relatively high salaries and make the federal government a relatively large component of the economic base as measured by labor. But, the trends in this sector are relative stable, and the federal government may service to buffer the volatility in other basic industries.

The Northeast Land Office

Description.

The Northeast Land Office is located in Lewistown. The persons in this office administer trust land in fifteen northeastern counties. The other major communities in the region are Havre, Glasgow, and Plentywood.

The total 2000 population in this region was 79,706 persons, representing approximately 8.8 percent of the state total. Nonfarm labor income during 2000 was $781 million (2000 dollars), about 6.0 percent of the total for Montana. If agricultural labor income (three year average) is added, the total rises to about $1.5 billion (2000 dollars), or 11.4 percent of the corresponding state total. The average per capita income in this region was $20,365 (2000 dollars) in 2000, about 9.6 percent below the statewide figure and the lowest of the six regions.

Long-Term Trends.

Population. The Northeast Region experienced overall population declines during the last thirty years. The number of persons dropped from 90,855 in 1970 to 79,706 in 2000. The fastest decline was in the 1980s, when population decreased at an average of 0.8 percent per year. The rate of decline moderated in between 1990 and 2000, when the decrease averaged 0.4 percent per year. Overall, the Northeast Region ranked fifth out of the six regions in terms of population growth. Conversely, it ranked second (behind the Southeast Region) in terms of population decline.

Per-capita Income. Per-capita income rose from $15,707 (2000 dollars) in 1970 to $20,365 (2000 dollars) in 2000. However, this growth was less than the statewide average and this region's figure dropped from 106.6 percent of Montana's per-capita income in 1970 to 90.4 percent in 2000. Most of this relative decline occurred between 1970 and 1980. During the 1980s and 1990s, the Northeast Region's per-capita income stabilized at roughly 90 percent of the statewide average.

Nonfarm Labor Income. This measure of overall economic performance grew an average of 2.9 percent per year in the 1970s, declined an average of 1.4 percent per year in the 1980s, and then resumed its growth at a 0.6 percent average annual rate in the 1990s. During the 1980s, this region was the fifth of the six regions in terms of nonfarm labor income growth, and it was the slowest growing region in the 1990s.

Short-Run Trends.

The economic indicators gave mixed messages in terms of this region's short term economic performance. The population continued to decline at an accelerated rate in the last half of the 1990s while nonfarm labor income growth accelerated between 1995 and

2000. Per-capita income growth accelerated slightly between 1995 and 2000, but this was less than statewide and per capita income dropped to 90.4 percent of Montana's.

Basic Industries.

Agriculture is, by far, the dominant basic industry in this region, and its volatility and generally downward trend are clearly present in the data. Agricultural labor income dropped from $395 thousand (2000 dollars) in 1970 to $72 thousand (2000 dollars) in 1980. It also varied from roughly $200 thousand (2000 dollars) in 1990 to $138 thousand (2000 dollars) in 2000. The figures for agriculture reported in Table 2 are three-year averages, and the volatility would have been even greater if the raw numbers were reported.

The mainline of the (now) BNSF railroad runs through this region, and represents most of the transportation category. Upgrading of the Hi-line during the late 1970s and early 1980s accounted for the peak in this category. Manufacturing is small in this region, and no one industry dominates.

Oil and gas related activities account for the largest share of mining. There was a boom these activities that began in the mid 1970s, peaked in the 1980s, and then declined thereafter. A large metal mine (gold) opened in the mid 1980s and closed about ten years later, exacerbating the decrease in oil and gas exploration.

The Central Land Office

Description.

The Central Land Office is located in Helena. There are fourteen counties in this region, which ranges from Wyoming to the Canadian border along the along the eastern front of the Rocky Mountains. The other major cities in this region are Great Falls and Bozeman. Conrad, Shelby, and Dillon are smaller cities in the region.

This is the largest DNRC Land Office Region in terms of population and overall economic activity. The 2000 population in this region was 285,863 persons, representing approximately 31.7 percent of the state total. Nonfarm labor income during 2000 was $4.4 billion (2000 dollars), about 33.4 percent of the state total. Per capita income in this region averaged $23,351 (2000 dollars) in 2000, about 3.7 percent above the figure for Montana.

Long-Term Trends.

Population. The Central Region experienced overall population growth between 1970 and 2000. The number of persons increased from 214,890 in 1970 to 238,074 in 1980, an average increase of 1.0 percent per year. The growth rate decelerated to 0.5 percent per year during the 1980s, and then accelerated to 1.3 percent per year in the 1990s. Overall, the Central Region's population growth rates in the 1980s and 1990s were roughly equal to the statewide average.

Per-capita Income. Per-capita income rose from $15,468 (2000 dollars) in 1970 to $23,351 (2000 dollars) in 2000. This growth was approximately equal to the statewide average and this region's per capita income remained three to five percent above the corresponding figure for Montana.

Nonfarm Labor Income. The overall economy of the Central Region grew an average of 3.4 percent per year in the 1970s, decelerated to 0.1 percent per year in the 1980s, and then accelerated to 3.4 percent average annual rate in the 1990s. Nonfarm labor income growth in this region was above the statewide figure most of the entire 1970 to 1990 period. It ranked second out of the six regions in the both the 1980s and the 1990s. The Central Region was only one of two regions to post an increase in the 1980s.

Short-Run Trends.

The economic indicators show overall growth in the last half of the 1990s.
The population and nonfarm labor income growth rates between 1995 and 2000 were slightly less than those experienced between 1990 and 1995. Per capita income growth accelerated slightly during the last half of the decade, but this was about equal to the state figure and this region remained about four percent above the Montana average. The Central Land Office region ranked "in the middle of the pack" in terms of short-run economic performance, fourth out of six in terms of both population and nonfarm labor income growth.

Basic Industries.

Nonresident travel is one of the two largest (along with manufacturing) basic industries in this region in 2000. Included in this industry are the resort areas (such as Big Sky) and Yellowstone National Park gateway businesses in Gallatin County, as well as the convention and lodging facilities in the major cities of Helena and Great Falls. Overall, the nonresident travel industry in this region almost tripled between 1970 and 2000, despite a decade of stability on the 1980s.

This region's manufacturing industry is diverse, with no single sector dominating. The important components include wood products, food products (such as the pasta plant in Great Falls), and primary metals (including the recently closed refinery in East Helena). Much of the growth in manufacturing in the 1990s was due to the development of the "high tech" sector in the Bozeman area.

Mining experienced overall growth during the 1970 to 2000 period, but with considerable volatility. This growth in this industry was due to expansions (and contractions) in metal mining, oil and gas exploration, and nonmetallic mining. The boom and bust oil and gas exploration caused the peak in the early 1980s and the trough in 1990. Metal mining increased as new facilities were opened in the 1980s and early 1990s, with closures and cutbacks at these facilities causing declines in the late 1990s. Metal mines include facilities such as the Golden Sunlight Mine in Jefferson County and the gold mine at Jardine in Park County. Examples of nonmetallic mining include the talc mines in Beaverhead County.

Agriculture was the largest basic industry as measured by labor income in 1970. Agricultural labor income decreased by almost two-thirds between 1970 and 2000. This probably overstates the actual decline in this industry because of the volatility in this industry.

The Southwest Land Office

Description.

The Southwest Land Office is located in Missoula. The persons in this office administer trust land in eight western Montana counties. The other major communities in the region are Butte and Anaconda.

The total 2000 population in this region was 190,162 persons, representing approximately 21.1 percent of the state total. Nonfarm labor income during 2000 was $2.8 billion (2000 dollars), about 21.6 percent of the total for Montana. Per capita income in this region was $22,109 (2000 dollars) in 2000, about 1.8 percent below the statewide figure.

Long-Term Trends.

Population. The Southwest Region experienced overall population growth between 1970 and 2000. The number of persons increased from 143,204 in 1970 to 162,511 in 1980, an average increase of 1.3 percent per year. Population declined slightly during the 1980s, decreasing at average rate of 0.1 percent per year. The trend reversed in the 1990s and the number or residents rose from 160,893 in 1990s to 190,162 in 2000, an annual average growth rate of 1.7 percent. The Southwest Region's population growth rates in the 1980s and 1990s were equal to or above the respective statewide averages; they were tied for third in the 1980s and second during the 1990s.

Per-capita Income. Per-capita income rose from $13,529 (2000 dollars) in 1970 to $22,109 (2000 dollars) in 2000. This growth was above the statewide average in the 1970s, but roughly equal to the Montana figure thereafter. Consequently, this region's per capita income rose from 91.8 percent to 95.8 percent of the state figure between 1970 and 1980, and remained in the 95.8 to 98.2 percent range for the next twenty years.

Nonfarm Labor Income. The overall economy of the Southwestern Region grew an average of 3.2 percent per year in the 1970s, declined an average of 0.2 percent per year in the 1980s, and then resumed its growth at a 3.7 percent average annual rate in the 1990s. Nonfarm labor income growth in this region was above the statewide figure for most of the 1970-2000 period. It ranked third out of the six regions in the 1980s and was the fastest growing region in the 1990s.

Short-Run Trends.

The last half of the 1990s saw overall growth of the economic indicators, but some performed better than others. Population growth decelerated sharply. Between 1995 and 2000, the number of residents in the Southwest Region increased only 1.0 percent per year. Per capita income growth accelerated slightly during the last half of the decade, and per capita income increased a bit to 98.2 percent of the statewide average. Nonfarm labor income grew at about the same rate throughout the decade, with the 1995-2000 figure being 3.6 percent per year. The Southwestern Region was above average in terms of economic growth between 1995 and 2000, population growth was second out of six regions and nonfarm labor income growth was first.

Basic Industries.

Manufacturing is the largest basic industry in the Southwestern Region, with wood and paper products accounting for about two-thirds of the total in 2000. Wood products grew during the 1970s due to the overall strong U.S. market and increasing labor intensity of production; the 1980s saw decreases resulting from U.S. economic conditions, introduction of labor saving technologies, and the shift to smaller trees; and the 1990 decreases can all directly or indirectly be attributed to a decreased timber supply from federal land. Despite the overall decline in wood and paper products during the 1980s and 1990s, there were increases in certain components and/or areas, such as log home manufacturing in Ravalli County. Also contributing to the sizable decline in manufacturing between 1980 and 1990 was the shutdown of the Anaconda Company copper refinery in Deer Lodge County. There are also numerous small manufacturing companies in the Missoula area.

Transportation consists mostly of railroads and trucking. The declines in the 1980s were due to the demise of the Milwaukee Road and consolidations and reorganizations along the old NP Lowline (now Montana Rail Link), running though Missoula and Butte. A number of long distance trucking firms are located in Missoula, perhaps, because of the proximity to I-90, a major east-west Interstate. These firms grew rapidly during the 1980s and 1990s.

Silver Bow County is part of the Southwestern Region. The decline is mining shown in Table 4 portrays the protracted and painful demise of the Anaconda Company and successor operators of underground and surface operations in the Butte area.

The Eastern Land Office

Description.

The Eastern Land Office is located in Miles City. This land office administers trust land in nine counties in eastern and southeastern Montana. The other major communities in the region are Sidney and Glendive

Although large is physical area, the Eastern Land Office economy is the smallest of the six DNRC land office regions. There were 47,995 persons living in the Eastern Land Office region in 2000, representing approximately 5.3 percent of the state total. Nonfarm labor income during 2000 was $614 Million (2000 dollars), about 4.7 percent of the total for Montana. Although farms and ranches are important to this region, the addition of agricultural labor does not significantly change the relative importance of the economy within the state. The average per capita income in this region was $20,951 (2000 dollars) in 2000, about 93.0 percent of the statewide figure.

Long-Term Trends.

Population. The Eastern Region lost population between 1970 and 2000. An energy boom (see below) led to a short-tem population increase from 51,302 in 1970 to 58,877 in 1980, an average growth of 1.0 percent per year. The trend then turned downward and the number of persons dropped to 51,400 in 1990 and then to 47,995 in 2000, representing average annual declines of 1.3 percent during the 1980s and 0.7 percent in the 1990s. Overall, the Eastern Region's rates of population decline in the 1980s and 1990s were the greatest among the land office regions.

Per-capita Income. Per-capita income rose from $14,467(2000 dollars) in 1970 to $20,951 (2000 dollars) in 2000. The growth after 1980 was less than the statewide average and this region's per capita income decreased about 10 percentage points relative to the Montana average by 2000.

Nonfarm Labor Income. The overall economy of the Eastern Region grew an average of 6.4 percent per year in the 1970s, due to the energy boom. Nonfarm labor income declined 3.2 percent per year in the 1980s and grew 0.8 percent per year in the 1990s. With the exception of the 1970s, nonfarm labor income growth in this region was much less than the statewide figure, and it ranked last of the six regions in the both the 1980s and the 1990s.

Short-Run Trends.

There were mixed signals in the economic trends during the last half of the 1990s. The population decline accelerated to 1.1 percent per year between 1995 and 2000. Per capita income growth accelerated slightly, and per capita income increased a bit to 93.0 percent of the statewide average. Nonfarm labor income growth decelerated to 0.5 percent per year during the1995 to 2000 period. Population and nonfarm labor income growth in the Eastern Region were well below their respective statewide averages between 1995 and 2000, and both ranked last among the six regions.

Basic Industries.

Coal mining and oil and gas exploration are the two major energy industries in the region, and both are classified in mining. The coal boom occurred first, in the mid to late 1970s, followed by an oil and gas boom, from the late 1970s to mid 1980s. Mining labor income increased more than four-fold between 1970 and 1980s, and then roughly halved from 1980 to 1990 due mostly to the bust in oil and gas related activities. Mining labor income remained roughly constant during the 1990s, but oil and gas exploration (which by now constituted the largest component of mining) underwent considerable technological change.

Agriculture labor income has experienced a long-term decline. Labor income earned on farms and ranches decreased by roughly two-thirds between 1970 and 1980. There was a slight increase between 1980 and 1990, but it dropped by another one-third between 1990 and 2000.

Transportation consists mostly of railroads. Labor income increased from 1970 to 1980, due mostly to reorganizations along the "Low-line." Railroad labor income declined sharply during the 1980s and rebounded again between 1990 and 2000. The growth in the 1990 may have been associated with facility upgrading and other aspects of increased coal hauling.

The Southern Land Office

The Southern Land Office is located in Billings. This district contains seven counties in south central Montana. The other communities in the region are Red Lodge and Hardin.

The 2000 population in this region was 168,992 persons, representing approximately 18.7 percent of the state total. Nonfarm labor income during 2000 was $2.8 billion (2000 dollars), about 21.5 percent of the total for Montana. The average per capita income in this region was $24,405 (2000 dollars) in 2000, about 8.4 percent above the statewide figure.

Long-Term Trends.

Population. The Southern Region experienced overall population growth between 1970 and 2000. The number of persons increased from 117,436 in 1970 to 142,056 in 1980, an average increase of 1.9 percent per year. The growth rate decelerated to 0.4 percent per year during the 1980s, and then accelerated to 1.4 percent per year in the 1990s. Overall, the Southern Region's population growth rates throughout the 1970 to 2000 period were above the statewide average.

Per-capita Income. Per-capita income rose from $15,344(2000 dollars) in 1970 to $24,405 (2000 dollars) in 2000. This growth was above the statewide average in the 1970s and 1990s and this region's per capita income remained six to eleven percent above the corresponding figure for Montana. The Southern Region had the highest per capita income among the six regions in 1990 and 2000.

Nonfarm Labor Income. The Central Region's economy grew an average of 5.5 percent per year in the 1970s, declined 0.4 percent per year in the 1980s, and then resumed its growth at an 3.3 percent average annual rate in the 1990s. Nonfarm labor income growth in this region was slightly above the statewide figure most of the entire 1970 to 1990 period. It ranked fourth out of the six regions in the 1980s and third in the 1990s.

Short-Run Trends.

The last half of the 1990s saw overall growth of the economic indicators, but some performed better than others. Population growth decelerated sharply. Between 1995 and 2000, the number of residents in the Southern Region increased only 0.8 percent per year. Per capita income growth accelerated slightly during the last half of the decade, and per capita income increased a bit to 8.4 percent above the statewide average. Nonfarm labor income grew at the same rate throughout the decade at 3.3 percent per year. The Southern Region was slightly above average in terms of economic growth between 1995 and 2000, population and nonfarm labor income growth were both third out of six regions.

Basic Industries.

Metal mining, coal mining, and oil and gas extraction are all significant components of mining in the Southern Region. Coal mining increased dramatically the mid 1970, and remained at roughly the same level during the 1980s and 1990s. Oil and gas exploration also began to increase in the 1970s, it reached a peak in the mid 1980s and subsequently declined, and then rebounded in the mid and late 1990s. A platinum-palladium mine in Stillwater County accounted for most of the growth in metal mining. It opened in the late 1980s and then underwent a number of expansions in the late 1990s.

Manufacturing includes a wide variety of industries and is mostly centered in Yellowstone County. The largest single component of manufacturing is oil refining (about 36 percent of the total in 2000), and this industry experienced significant growth the late 1990s as the Billings refineries were modified and refitted. Other major components include food products (about 13 percent), printing and publishing (about 11 percent), and fabricated metal (about seven percent).

Agriculture labor income has experienced a long-term decline. Labor income earned on farms and ranches decreased by roughly three-fourths between 1970 and 1980. There was a recovery between 1980 and 1990, but it dropped by another one-half from 1990 to 2000.

The Northwestern Land Office

Description. The Northwestern Land Office is located in Kalispell. There are four counties in this region located in the far northwestern portion of Montana. The other major cities in this region are Libby, Columbia Falls, and Polson.

The total 2000 population in this region was 130,439 persons, representing approximately 14.4 percent of the state total. Nonfarm labor income during 2000 was $1.7 billion (2000 dollars), about 12.8 percent of the total for Montana. The average per capita income in this region was $20,732 (2000 dollars) in 2000, about 92.1 percent of the statewide figure and the second lowest of the six regions.

Long-Term Trends.

Population. The Northwest Region experienced strong population growth throughout the 1970-2000 period. The number of persons increased from 79,485 in 1970 to 97,653 in 1980, an average increase of 2.1 percent per year. Population growth decelerated slightly during the 1980s, growing at an average rate of 0.9 percent per year. Population growth accelerated again in the 1990s and the number or residents rose from 106,772 in 1990s to 130,439 in 2000, an annual average growth rate of 1.7 percent. The Northwest Region consistently ranked first in terms of population growth throughout the 1970 to 2000 period.

Per-capita Income. Per-capita income rose from $13,100 (2000 dollars) in 1970 to $20,732 (2000 dollars) in 2000. This growth was about equal to the statewide averages during the 1970-2000 period. Consequently, this region's per capita income remained below the Montana average, ranging from six to eleven percent below the statewide figure. The Northwest Region's per capita income consistently ranked lowest or next to lowest (fifth or sixth) among the DNRC regions.

Nonfarm Labor Income. The overall economy of the Northwestern Region grew an average of 3.4 percent per year in the 1970s, decelerated to 1.2 percent per year in the 1980s, and accelerated to a 3.3 percent average annual growth rate in the 1990s. Nonfarm labor income growth in this region was roughly equal to or greater than the statewide figures for during the 1980s and 1990s. It ranked first in the 1980s, and was one of only two regions to post a positive figure, and fourth in the 1990s.

Short-Run Trends.

The last half of the 1990s saw overall growth in the economic indicators, but some performed better than others. Population growth decelerated sharply. Between 1995 and 2000, the number of residents in the Northwest Region increased only 1.2 percent per year. Per capita income growth accelerated slightly during the last half of the decade, and per capita income inched upward to 92.1 percent of the average for Montana. Nonfarm labor income accelerated ever so slightly, with the 1995-2000 figure being 3.4 percent per year. The Norwest Region was above average in terms of economic growth between 1995 and 2000, population growth ranked first and nonfarm labor income ranked second among the six regions.

Basic Industries.

Manufacturing is the dominant basic industry in the Northwest Region. The wood products industry is the most important component, accounting for approximately 53 percent of the total in 2000. Among the other significant sectors are "high tech" (Semitoool) and primary metals refining (Columbia Falls Aluminum Company). The approximate stability of manufacturing during the 1990s is the next result of different trends in the components. The wood products industry reached at peak about 1994 and has declined since then. Primary metal was roughly stable or declining during the 1990s. "High Tech" grew rapidly during the latter portion of the decade.

Transportation consists mostly of railroads and trucking. The mainline of the BNSF railroad goes through the Northwest Region, and the company maintains a major facility at Whitefish. Railroad labor income has remained roughly stable through out the 1990s. The growth in transportation has been mostly in trucking. Some of this increase may be do to the reclassification of log truck from the wood products industry to transportation.

Nonresident travel is one of the three largest basic industries in this region. Flathead County serves as the major gateway to Glacier National Park. Overall, the nonresident travel industry in the Northwest Region more than tripled between 1970 and 2000, despite a fifteen percent decline in the 1980s.

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Table 5
Selected Economic Indicators Eastern Land Office

	1970	1980	1990	1995	2000	Annual Percent Change 1970-80	1980-90	1990-00	1995-00
Population	51,302	58,877	51,400	50,817	47,995	1.4	-1.3	-0.7	-1.1
Per Capita Income (2000$)	14,467	19,155	18,465	18,848	20,951	2.8	-0.4	1.3	2.1
Percent of MT	*98.2*	*103.9*	*93.7*	*92.5*	*93.0*				
Nonfarm Labor Income (Thous. of 2000$)	423,264	787,202	568,752	600,116	613,974	6.4	-3.2	0.8	0.5
Basic Industry Labor Income									
Agriculture	142,576	46,893	56,115	33,150	36,235	-10.5	1.8	-4.3	1.8
Ag. Serv. And Forestry	5,996	4,022	6,938	7,445	7,725	-3.9	5.6	1.1	0.7
Mining	28,931	132,609	59,569	57,552	56,167	16.4	-7.7	-0.6	-0.5
Manufacturing	17,504	17,129	16,133	19,901	18,018	-0.2	-0.6	1.1	-2.0
Transportation	42,878	68,522	41,760	45,117	49,353	4.8	-4.8	1.7	1.8
Nonresident Travel	10,708	18,009	7,915	11,896	9,829	5.3	-7.9	2.2	-3.7
Federal Gov't	26,841	41,732	43,695	44,612	40,832	4.5	0.5	-0.7	-1.8
	14736.58	18433.21	19715.75	20386	22517.55				

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 7
Selected Economic Indicators Northwest Land Office

	1970	1980	1990	1995	2000	1970-80	1980-90	Annual Percent Change 1990-00	1995-00
Population	79,485	97,653	106,772	123,080	130,439	2.1	0.9	2.0	1.2
Per Capita Income (2000$)	13,100	16,795	18,554	18,763	20,732	2.5	1.0	1.1	2.0
Percent of MT	88.9	91.1	94.1	92.0	92.1				
Nonfarm Labor Income (thous. of 2000$)	765,602	1,068,923	1,204,892	1,412,535	1,672,155	3.4	1.2	3.3	3.4
Basic Industry Labor Income									
Agriculture	34,318	17,881	14,848	4,217	4,064	-6.3	-1.8	-12.2	-0.7
Ag. Serv. And Forestry	6,476	7,230	13,165	13,158	20,036	1.1	6.2	4.3	8.8
Mining	12,992	16,038	28,986	7,891	8,503	2.1	6.1	-11.5	1.5
Manufacturing	196,520	268,720	255,288	229,490	250,455	3.2	-0.5	-0.2	1.8
Transportation	42,955	58,056	56,202	53,383	59,689	3.1	-0.3	0.6	2.3
Nonresident Travel	16,851	40,589	34,149	40,964	61,509	9.2	-1.7	6.1	8.5
Federal Gov't	55,248	89,554	91,231	95,293	104,525	4.9	0.2	1.4	1.9

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 1
Selected Economic Indicators
Montana

						Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	697,172	788,752	800,204	876,553	903,157	1.2	0.1	1.2	0.6
Per Capita Income (2000$)	14,737	18,433	19,716	20,386	22,518	2.3	0.7	1.3	2.0
Nonfarm Labor Income (thous. of 2000$)	6,751,252	9,920,093	9,620,853	11,230,117	13,052,804	3.9	-0.3	3.1	3.1
Basic Industry Labor Income									
Agriculture	1,093,173	288,781	553,007	361,607	320,429	-12.5	6.7	-5.3	-2.4
Ag. Serv. And Forestry	44,622	46,381	90,078	92,500	133,659	0.4	6.9	4.0	7.6
Mining	259,463	508,123	317,262	320,906	297,229	7.0	-4.6	-0.7	-1.5
Manufacturing	731,346	918,617	737,066	739,745	816,142	2.3	-2.2	1.0	2.0
Transportation	373,362	523,357	375,790	383,544	414,440	3.4	-3.3	1.0	1.6
Nonresident Travel	167,699	302,822	236,341	334,539	365,700	6.1	-2.4	4.5	1.8
Federal Gov't	704,455	858,034	934,191	963,430	1,047,387	2.0	0.9	1.2	1.7

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 4
Selected Economic Indicators Southwest Land Office

	1970	1980	1990	1995	2000	Annual Percent Change 1970-80	1980-90	1990-00	1995-00
Population	143,204	162,511	160,893	180,759	190,162	1.3	-0.1	1.7	1.0
Per Capita Income (2000$)	13,529	17,655	19,152	19,960	22,109	2.7	0.8	1.4	2.1
Percent of MT	91.8	95.8	97.1	97.9	98.2				
Nonfarm Labor Income (thous. of 2000$)	1,463,833	2,006,534	1,960,435	2,360,286	2,823,375	3.2	-0.2	3.7	3.6
Basic Industry Labor Income									
Agriculture	27,808	12,578	13,173	168	5,193	-7.6	0.5	-8.9	98.7
Ag. Serv. And Forestry	7,963	6,657	16,052	14,896	24,898	-1.8	9.2	4.5	10.8
Mining	160,476	111,560	42,163	55,805	25,372	-3.6	-9.3	-5.0	-14.6
Manufacturing	216,951	277,946	224,579	199,482	217,423	2.5	-2.1	-0.3	1.7
Transportation	87,114	106,579	94,152	111,728	116,256	2.0	-1.2	2.1	0.8
Nonresident Travel	31,873	53,419	34,829	58,188	48,244	5.3	-4.2	3.3	-3.7
Federal Gov't	110,659	150,722	141,860	147,061	173,118	3.1	-0.6	2.0	3.3

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 3
Selected Economic Indicators Central Land Office

	1970	1980	1990	1995	2000	Annual Percent Change 1970-80	1980-90	1990-00	1995-00
Population	214,890	238,074	250,584	275,944	285,863	*1.0*	*0.5*	*1.3*	*0.7*
Per Capita Income (2000$)	15,468	19,049	20,424	21,200	23,351	*2.1*	*0.7*	*1.3*	*2.0*
Percent of MT	105.0	103.3	103.6	104.0	103.7				
Nonfarm Labor Income (thous. of 2000$)	2,232,402	3,110,647	3,131,671	3,726,427	4,356,531	*3.4*	*0.1*	*3.4*	*3.2*
Basic Industry Labor Income									
Agriculture	329,474	98,344	206,293	139,077	105,790	*-11.4*	*7.7*	*-6.5*	*-5.3*
Ag. Serv. And Forestry	9,171	11,907	20,234	23,950	34,902	*2.6*	*5.4*	*5.6*	*7.8*
Mining	22,581	79,647	66,126	76,090	55,358	*13.4*	*-1.8*	*-1.8*	*-6.2*
Manufacturing	142,337	161,270	107,924	142,133	171,067	*1.3*	*-3.9*	*4.7*	*3.8*
Transportation	116,252	152,050	85,741	93,034	103,875	*2.7*	*-5.6*	*1.9*	*2.2*
Nonresident Travel	65,474	118,101	117,653	161,868	183,275	*6.1*	*-0.0*	*4.5*	*2.5*
Federal Gov't	367,549	406,083	452,003	456,238	482,758	*1.0*	*1.1*	*0.7*	*1.1*

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 2
Selected Economic Indicators Northeast Land Office

						Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	90,855	89,581	82,917	83,463	79,706	*-0.1*	*-0.8*	*-0.4*	*-0.9*
Per Capita Income (2000$)	15,707	16,305	18,642	19,028	20,365	*0.4*	*1.3*	*0.9*	*1.4*
Percent of MT	*106.6*	*88.5*	*94.6*	*93.3*	*90.4*				
Nonfarm Labor Income (thous. of 2000$)	635,569	845,835	735,902	743,815	780,866	*2.9*	*-1.4*	*0.6*	*1.0*
Basic Industry Labor Income									
Agriculture	395,819	72,354	199,634	151,084	138,525	*-15.6*	*10.7*	*-3.6*	*-1.7*
Ag. Serv. And Forestry	6,939	6,538	10,775	12,809	16,684	*-0.6*	*5.1*	*4.5*	*5.4*
Mining	6,329	39,595	35,221	22,007	11,993	*20.1*	*-1.2*	*-10.2*	*-11.4*
Manufacturing	30,524	23,089	23,140	15,786	14,741	*-2.8*	*0.0*	*-4.4*	*-1.4*
Transportation	56,069	90,548	67,490	53,171	54,291	*4.9*	*-2.9*	*-2.2*	*0.4*
Nonresident Travel	11,086	18,571	13,679	15,751	16,486	*5.3*	*-3.0*	*1.9*	*0.9*
Federal Gov't	64,207	58,218	64,078	65,328	71,079	*-1.0*	*1.0*	*1.0*	*1.7*

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

Table 6
Selected
Economic
Indicators
Southern
Land
Office

	1970	1980	1990	1995	2000	Annual Percent Change 1970-80	1980-90	1990-00	1995-00
Population	117,436	142,056	147,638	162,490	168,992	*1.9*	*0.4*	*1.4*	*0.8*
Per Capita Income (2000$)	15,344	20,460	21,007	21,876	24,405	2.9	*0.3*	*1.5*	2.2
Percent of MT	*104.1*	*111.0*	*106.5*	*107.3*	*108.4*				
Nonfarm Labor Income (thous. of 2000$)	1,230,581	2,100,952	2,019,201	2,386,938	2,805,903	5.5	*-0.4*	3.3	*3.3*
Basic Industry Labor Income									
Agriculture	163,177	40,730	62,943	33,911	30,621	*-13.0*	*4.4*	*-7.0*	*-2.0*
Ag. Serv. And Forestry	8,077	10,026	22,914	20,242	29,414	2.2	*8.6*	2.5	*7.8*
Mining	28,154	128,673	85,197	101,561	139,836	*16.4*	*-4.0*	*5.1*	6.6
Manufacturing	127,508	170,464	110,001	132,952	144,438	2.9	*-4.3*	*2.8*	*1.7*
Transportation	28,093	47,601	30,445	27,111	30,976	*5.4*	*-4.4*	*0.2*	*2.7*
Nonresident Travel	31,707	54,132	28,115	45,873	46,358	*5.5*	*-6.3*	*5.1*	*0.2*
Federal Gov't	79,951	111,726	141,324	154,898	175,075	*3.4*	2.4	*2.2*	2.5

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

	2000	2005	2010	2015	2020	2025
Helena						
TOTAL POPULATION (THOUSANDS)	285.947	299.152	314.599	330.854	347.833	365.603
nonfarm (2000$)	4356.937	4874.543	5426.837	6031.102	6688.235	7400.337
PERSONAL INCOME (2000 $)	6675.899	7492.185	8315.138	9226.090	10232.14	11342.61
PCY (2000$)	23346.63	25044.74	26430.91	27885.68	29416.83	31024.39
Lewistown						
TOTAL POPULATION (THOUSANDS)	79.729	78.045	77.427	77.038	76.827	76.759
nonfarm (2000$)	780.9301	841.0773	895.4571	955.1436	1021.023	1093.873
PERSONAL INCOME (2000 $)	1623.319	1778.706	1887.169	2006.996	2139.766	2286.971
PCY (2000$)	20360.46	22790.77	24373.53	26052.03	27851.75	29794.17
Miles City						
TOTAL POPULATION (THOUSANDS)	48.009	47.284	47.287	47.434	47.647	47.952
nonfarm (2000$)	614.0315	691.2994	749.6756	810.4908	873.7881	939.6587
PERSONAL INCOME (2000 $)	1005.657	1114.330	1195.929	1283.100	1376.427	1476.556
PCY (2000$)	20947.26	23566.76	25290.86	27050.22	28888.02	30792.38
Missoula						
TOTAL POPULATION (THOUSANDS)	190.216	201.85	216.04	230.708	245.88	261.605
nonfarm (2000$)	2823.635	3205.967	3625.740	4079.457	4575.769	5122.714
PERSONAL INCOME (2000 $)	4204.704	4761.363	5428.979	6165.806	6980.874	7883.928
PCY (2000$)	22104.89	23588.62	25129.51	26725.58	28391.38	30136.76
Billings						
TOTAL POPULATION (THOUSANDS)	169.039	177.638	186.731	196.342	206.354	216.874
nonfarm (2000$)	2806.166	3110.595	3427.488	3775.578	4158.862	4582.347
PERSONAL INCOME (2000 $)	4124.626	4581.461	5059.633	5589.857	6179.484	6837.376
PCY (2000$)	24400.44	25791.00	27095.84	28470.00	29946.03	31526.95

	2000	2005	2010	2015	2020	2025
Kalispell						
TOTAL POPULATION (THOUSANDS)	130.476	142.142	154.293	166.84	179.68	193.044
nonfarm (2000$)	1672.308	1928.284	2186.426	2462.842	2761.298	3085.053
PERSONAL INCOME (2000 $)	2704.567	3119.866	3554.505	4030.761	4556.281	5138.890
PCY (2000$)	20728.46	21948.94	23037.37	24159.44	25357.75	26620.30
Montana						
Pop	903.416	946.111	996.377	1049.216	1104.221	1161.837
nonfarm (2000$)	13054.00	14651.76	16311.62	18114.61	20078.97	22223.98
PERSONAL INCOME (2000 $)	20338.77	22847.91	25441.35	28302.61	31464.98	34966.33
PCY (2000$)	22513.18	24149.29	25533.86	26975.01	28495.18	30095.73

Appendix C

GIS Data Report

Geographic Information Services and Consulting
assisting with geographic information systems analysis and support for:
Programmatic Environmental Impact Statement for
DNRC State Trust Land Special Uses Division

Prepared for DNRC State Trust Land Special Uses Division

Prepared by Geodata Services, Inc.
104 South Ave. E.
Missoula MT 59801

May 25 , 2004

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Introduction

This report details the geographic information system analysis and support for strategic planning associated with State Trust Lands. The GIS services involved data procurement, processing, analysis, and graphic support for DNRC staff and contracted researchers working on economic and social assessments of state trust lands. Geodata Services, Inc. developed GIS layers combining commercial and residential property with state trust land parcels and ancillary geospatial data in order to provide a foundation for assessing the relative potential of state trust lands to allow commercial, industrial, residential or other special uses. GIS analysis was also used by Dr Jackson in the financial analysis using a nearest neighbor approach, combining Montana Department of Revenue land appraisal values, with land use codes, residential housing density, development rates by decade, proximity measures to commercial and industrial properties. Individual properties were combined into aggregate summaries by county for acreage classifications of residential, commercial and industrial properties.

This appendix report is divided into the following sections:

1. Data sources and summary description
2. Methods and analysis procedures
3. GIS deliverables
4. Analysis results

Data Sources and Summary Description

Data sources

Geographic Information Systems (GIS) was used in this project to calculate geospatial variables for subsequent analysis and modeling of commercial and residential potential of state trust lands. Base layers include the following layers and sources and their accompanying summary description and synopsis of their use.

Montana cadastral ownership maps maintained by the Department of Administration.

This layer provided the base for all private residential land and commercial properties in Montana. It included coverage in every county, though some counties were still incomplete. The Information Services Division of the Montana Department of Administration provided Geodata with a statewide geodatabase of the parcel layer based on the July, 2003 status of the ownership parcels. The databases for this system are updated twice each year. This geodatabase with approximately 800,000 parcels was used for two portions of the analysis, measuring distances to residential, commercial and industrial properties from each DNRC trust land parcel, and calculating housing density, year built, within the neighboring areas around each trust land parcel.

The parcels included a geocode, which is an identification number intended to be unique for each parcel. The Department of Revenue Computer Assisted Mass

Appraisal System (CAMA) included the residential and commercial property tax system. A centroid point was derived for each parcel and these points were overlaid on the land office polygons and each parcel assigned to a land office. The parcels and centroid points were linked to the residential CAMA database via the geocode identifier. A similar process was used to link the parcels to the commercial CAMA database for commercial and industrial parcels.

Digital Elevation Model

A statewide digital elevation model (DEM), with a 30 meter resolution was obtained from the Natural Resource Information System at the Montana State Library. To facilitate subsequent processing, the DEM was resampled to a resolution of 90 meters. A slope map, calculated in percent, was created from the resampled DEM. The slope map was also reclassified to identify slopes greater than 25% which were too steep for septic systems, forming a portion of the identification of developable areas. It was also used as a modifier in the floodplain surrogate buffer. The DEM was also used to derive a shaded relief grid, used as a backdrop for presentations and map graphics.

State Trust Land Parcels

The state trust land GIS layer used for this analysis was provided by DNRC GIS staff. Neither DNRC staff, nor Department of Revenue or Department of Administration staff had integrated state CAMA geocodes into the state trust land database or digital GIS file. In spite of these limitations, this GIS data layer was used as it was without additional modification as the base state trust land layer for this project, and without trying to match the parcels spatially to the cadastral GIS layer to match geocodes. The GCDB survey control that the state trust lands layer was based on was also updated. As a result of these considerations there were small anomalies and geographic slivers resulting from the overlays that we were forced to accept in the course of analysis. Overall, they had minimal impact on the outcome. Each DNRC trust land parcel was also used as the source for Thiessen polygon neighborhood delineation, which were the neighborhood polygons used in this analysis for variables measured at the neighborhood level.

Roads

Broad coverage of roads was available at a scale of 1:100,000 based on Census based Tiger files. The public domain files were available from the Montana state library. This project used the ESRI nationwide street database in ArcGIS StreetMap USA from Geographic Data Technology, Inc. (GDT) commercially enhanced street files, built on this Tiger base but enhanced with more recent development and more roads. This street database enhances TIGER 2000 source data and provides a nationwide base map for routing and drive time analysis. Although many small rural roads and forest roads are not on these layers, they include most paved county roads and generally represent the development potential for most areas. Roads were used in the proximity analysis for potential development, and in the economic valuation nearest neighborhood analysis. The GDT roads layer is a proprietary commercial GIS layer.

Business Locations

ESRI Business Analyst software includes a national database of more than 12 million U.S. businesses from InfoUSA, which was used to supplement the Montana cadastral data and provide an alternative measure of commercial site proximity. These data include sites not available through the Montana commercial CAMA data. The CAMA data was based on property ownership, the InfoUSA was based on business address. Between these two commercial geospatial map layers, most commercial activity in Montana were mapped at a level of detail suitable for nearest neighbor analysis at a fine grained scale. The ESRI Business Analyst data also included shopping center data. The National Research Bureau tracked the following information on nearly 14,000 shopping centers with more than 100,000 square feet of gross leasable area (GLA) across the United States: alphabetical listing, center name, metropolitan statistical area (MSA), city, county, market positioning strategy, space availability, planned/proposed/new centers, expanding/renovating centers, major owner, leasing agent, and management. These were provided by point location based on address, and used in the proximity analysis. This database did not contain any shopping centers in the Eastern Land Office. They were also used to extract hospital locations, a key variables in the residential growth analysis. The InfoUSA and NRB GIS layers are a proprietary commercial GIS layers.

Airports

This data set includes airports in the United States, Puerto Rico and the U.S. Virgin Islands. The data were derived from an extract of the Public Use Airports database of the National Transportation Atlas Databases-2001 (NTAD-2001), published by the Bureau of Transportation Statistics, Department of Transportation. This map layer included airports in the 50 United States, Puerto Rico, and the U.S. Virgin Islands with enplanements greater than or equal to 250 passengers per year. There were 21 airports in the database in Montana, and all were used in the analysis.

Streams

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order. The NHD is based upon the content of USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD supersedes DLG and RF3 by incorporating them, not by replacing them. Users of DLG or RF3 will find the National Hydrography Dataset both familiar and greatly expanded and refined. It was initially developed at a scale of 1:100,000. This stream layer was used for distance measurements.

Demographic Data

ESRI Business Analyst software contains over 300 demographic variables. This study used the household change between 1990 and 2000 and the predicted change between

2003 and 2008 as part of the analysis for potential residential growth and for the financial nearest neighbor analysis. The geographic units for this analysis was census block groups. The ESRI Business Analyst layer is a proprietary commercial GIS layer.

Public Land Ownership

The NRIS program at the Montana State Library maintains a 1:100,000 scale public land ownership and stewardship layer. This layer was used for distance measures to public lands and to extract state trust land areas under some form of conservation easement. This layer was not regularly maintained, it was not up to date everywhere in the state, and it did not include county and municipal lands. However, it was the best composite layer for public lands and was used as is with no further checks or modifications. The Montana Cadastral map layer and CAMA included public land ownership, but tended to lump all federal and state lands into single categories, so the parcel layer was not used in this study to identify public lands used in subsequent proximity analysis.

Floodplain

Another portion of the developable land base identification was based on floodplain areas, which were less likely to be developed. Digital versions of floodplain maps, developed and maintained by the Federal Emergency Management Agency were available for portions of 17 Montana counties, representing a small percentage of the total area. To simulate floodplains consistently throughout Montana a one-quarter mile buffer zones around all perennial streams (based on the National Hydrologic Data at a scale of 1:100,000)was weighted inversely by slope to create a variable width estimated floodplain that was narrower where slopes were steep.

Miscellaneous Layers

For general mapping and location reference, county, state, river, lakes, towns and cities were required. This project used layers provided by NRIS, typically at the 1:100,000 scale or smaller.

DNRC field offices and regions

Field office boundaries were acquired from DNRC GIS staff in digital form and used as is with no further modifications.

GIS Deliverables

The primary deliverable product for this contract was a GIS layer of state trust land parcels with accompanying database containing the attributes measured in this study and metadata and documentation on the map layers and analysis process. The DNRC land office boundaries layer is also included as a deliverable. This layer was provided by DNRC and no changes were made to it. The following attributes were developed and included in the state trust land parcel database:

Distance and proximity

Distance measurements from state trust land parcels to variables related to residential growth

- Residential parcels with existing residences in the Montana cadastral property database (All residences /5 yr/10 yr)
- Commercial parcels in the Montana cadastral property database
- Industrial parcels in the Montana cadastral property database
- Commercial businesses in the InfoUSA database
- Shopping centers in the NRB shopping centers database
- Conservation easements
- Perennial streams
- Public land
- Roads
- Hospitals
- Airports with emplanements greater than or equal to 250 passengers per year

Acreage summaries of selected characteristics for each state trust land parcel

- Floodplain
- Slopes greater than 25%
- Developable area (slopes < 25% and not floodplain)
- Road access
- Contiguity to other state trust land parcels forming blocks of land larger than 1 square mile in size.
- Standard deviation of elevation
- Road density

Acreage summaries of selected characteristics for the neighborhoods surrounding each state trust land parcel (Thiessen polygons were used to define neighborhoods and are defined as the area that is closest to the parcel centroid relative to all other parcel centroids)

  - Average value of the year residence built, year remodeled, effective year modifier, land value attributes, count of residences in neighborhhood, housing density per acre were derived to aid Dr Jackson to fit a regression model. Land value attributes and the count of commercial and industrial parcels were also derived.
  - Change in the number of households from 1990 to 2000 and the predicted annual change from 2003 to 2008

Summarization of quantiles

The values for the distance measurement variables and the neighborhood values were categorized into quantiles by each land office and assigned a high, medium, or low class value (High=>75%, Medium=50-75%, Low=<25%)

Residential Model Calculation

The residential model was calculated by summing the quantile values for the following attributes. Quantiles were calculated by each land office.

- Distance to the nearest residence
- Distance to the nearest residence built in the last five years
- Distance to the nearest perennial stream
- Distance to the nearest state or county road
- Distance to the nearest commercial business (by address)
- Distance to the nearest major shopping center
- Distance to the nearest commercial parcel
- Distance to the nearest hospital
- Distance to the nearest airport serving more than 250 passengers
- Number of residential parcels in the neighborhood
- Average road density in neighborhood
- Increase in households in neighborhood between 1990 and 2000
- Predicted increase in households in neighborhood between 2003 and 2008
- Standard deviation of elevation in neighborhood

Commercial/Industrial Model Calculation

The commercial/industrial model used the following components. Both commercial and industrial parcels were combined for this analysis. DNRC staff selected the final variables for the commercial/industrial models with GIS technical advice from Geodata Services. Unlike the residential model, which was run with each land office in isolation, the commercial/industrial model was run statewide for all trust land parcels. The longest measured distance required by the analysis was two miles, so the influence of an adjacent land office was not applicable. The model variables included:

1) All parcels within 2 miles of a major town (major towns were defined as those included on the Census 2000 layer from NRIS)
2) Within 1 mile of the 624 largest towns in Montana (from NRIS "Montana towns" GIS layer)
3) Intersection of areas within 1/4 mile of a major highway and within 1/4 mile of an existing commercial or industrial parcel from CAMA commercial property tax database
4) Results of steps 1-3 overlaid with slopes greater and less than 25%, and simulated floodplain to determine developable portions

The resulting grid map was processed with zonal statistics and summarized in the database for each trust land parcel. The deliverable layer for commercial included a selected subset of the trust land map layer that had at least 2 acres of commercial/industrial modeled land within it.

Data Attributes for State Trust Land Parcels

Table 1 Database attributes for state trust land parcels

Field Name	**Description**
AREA (sq meters)	
PERIMETER (meters)	
ACRES	
TWNRNGSEC	DNRC field
EMNT	DNRC field
SECTIONACR	DNRC field
SURFACEACR	DNRC field
SURFLEGAL	DNRC field
AREAOFFICE	DNRC field
UNITOFFICE	DNRC field
COMMENT	DNRC field
DATA_PRES	DNRC field
ACRE_DIF	DNRC field
SOURCE	DNRC field
EDIT_DATE	DNRC field
FORNONFOR	DNRC field
USGSFORNON	DNRC field
AUTO_ID	Unique id for each parcel
CO_NAME	County name - based on centroid point for parcel
Straight Line Distance Measurements (meters)	
D_res	Residences All – D(Dwelling) or M (Mobile)
D_res5	Residences Built in Last Five Years (2003-1998)
D_res10	Residences Built in Last Ten Years (2003-1993)
D_comm	Commercial All
D_ind	Industrial All
D_bus	Businesses All
D_shopctr	Shopping Centers All
D_cons	Conservation Easements All
D_pstream	Perennial Streams All
D_public	Public Land (DNRC parcels excepted)
D_roads	Roads All
D_Hosp	Hospitals All
D_Usgsair	Airports All
DNRC Parcels	
Floodplain	From NHD – perennial streams with ¼ mile buffer. Area in sq meters
Floodppct	Percent of parcel in floodplain
Slope	From 90 meter DEM – slope greater than 25%.

	Area in sq meters
Slopepct	Percent of parcel with slope greater than 25%
Develop	Area of parcel outside floodplain and less than 25% slope ("developable"). Area in sq meters.
Developpct	Percent of parcel outside floodplain and less than 25%
Rdaccess	1=Road Access / 0=No road access (with 100 meter buffer on roads) for developable portion of DNRC parcels
Contiguous	1=Contiguous / 0=Not Contiguous for DNRC parcels with shared perimeters with combined acreage greater than 660 acres
Elev_Stdev	Standard Deviation of elevation (from DEM)
Road_Densi	Density of linear features
Values from Thiessen polygons (neighborhoods)	
Av_yrblt	Average year residence built
Av_yrrmod	Average year residence remodelled
Av_yreff	Average effective year for residence
Av_totflv	Average Total Land Value for residence
Cnt_res	Count of parcels with a residence in each Thiessen polygon
Av_hd_acre	Average housing density/acre based on residence parcel size
Av_comland	Average Total Land Value for commercial parcels
Cnt_com	Count of commercial parcels in Thiessen polygon
Av_indland	Average Total Land Value for industrial parcels
Cnt_ind	Count of industrial parcels in Thiessen polygon
Dh9000	Household difference from 1990 to 2000
Dh0308	Household difference from 2003 to 2008
Dh9000a	Annual rate – household difference 1990 to 2000
Dh0308a	Annual rate – household difference 2003 to 2008
Quantile Values (calculated by each land office)	Low=<25%/Medium=25%-75%/High=>75%
Q_D_res	1=Low/2=Medium/3=High
Q_D_res5	1=Low/2=Medium/3=High
Q_D_res10	1=Low/2=Medium/3=High
Q_D_comm	1=Low/2=Medium/3=High
Q_D_ind	1=Low/2=Medium/3=High
Q_D_cons	1=Low/2=Medium/3=High

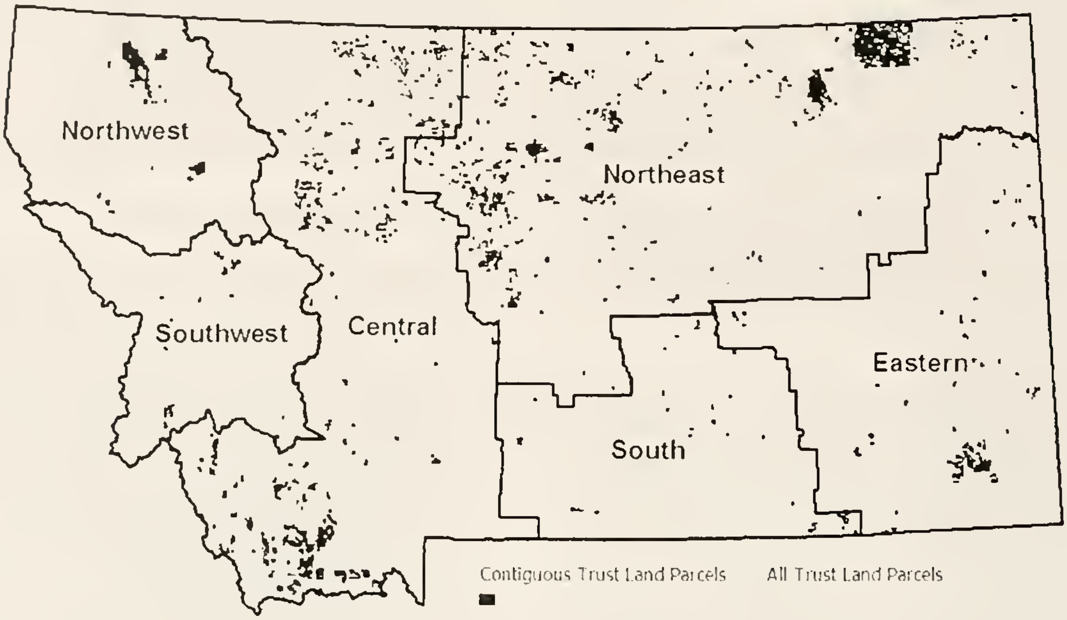
Q_D_pstrm	1=Low/2=Medium/3=High
Q_D_public	1=Low/2=Medium/3=High
Q_D_roads	1=Low/2=Medium/3=High
Q_D_bus	1=Low/2=Medium/3=High
Q_D_shop	1=Low/2=Medium/3=High
Q_Av_yrblt	1=Low/2=Medium/3=High
Q_Av_yrrmd	1=Low/2=Medium/3=High
Q_Av_yreff	1=Low/2=Medium/3=High
Q_Av_hdac (Avg Housing Density/Acre)	1=Low/2=Medium/3=High
Q_Av_r_val (Avg Total Land Value for Residence)	1=Low/2=Medium/3=High
Q_Av_c_val (Avg Total Land Value for Commercial)	1=Low/2=Medium/3=High
Q_Av_i_val (Avg Total Land Value for Industrial)	1=Low/2=Medium/3=High
Q_Dh9000	1=Low/2=Medium/3=High
Q_Dh0308	1=Low/2=Medium/3=High
Q_Dhosp	1=Low/2=Medium/3=High
Q_D_Usgsai	1=Low/2=Medium/3=High
Q_Elevstd	1=Low/2=Medium/3=High
Q_Rddens	1=Low/2=Medium/3=High
Q_Cnt_res	1=Low/2=Medium/3=High
Q_Fmodel	1=Low/2=Medium/3=High
Residential Land Model (calculated by each land office)	
Fin_Model	Q_D_res + Q_D_res5 + Q_D_pstrm + Q_D_roads + Q_D_bus + Q_D_shop + Q_D_comm + Q_D_hosp + Q_D_usgsai + Q_cnt_res + Q_rddens + Q_dh9000 + Q_dh0308 + Q_elevstd

Methods and analysis procedures

State trust land contiguity

Initial methodology proposed using clusters of trust land parcels, such as the state forests, as the trust land parcel source for neighborhood analyses. Although these clusters of trust land parcels were not used as the unit of analysis in the final methodology, state trust land parcels that were in contiguous blocks were identified for future analysis by dissolving the polygon coverage and determining which resulting parcels were larger than 660 acres (640 acres plus 20 acres to account for section anomalies). Some special uses may be possible in these areas that are not possible elsewhere. Parcels that are contiguous only on one corner, i.e. checkerboard ownership, were not considered contiguous for this step. It also would be useful to examine state trust lands contiguous to public land parcels. Some idea of contiguity was important, however, particularly in future site analysis following the programmatic GIS.

Figure 1 Contiguous trust land parcels larger than 1 sq mile

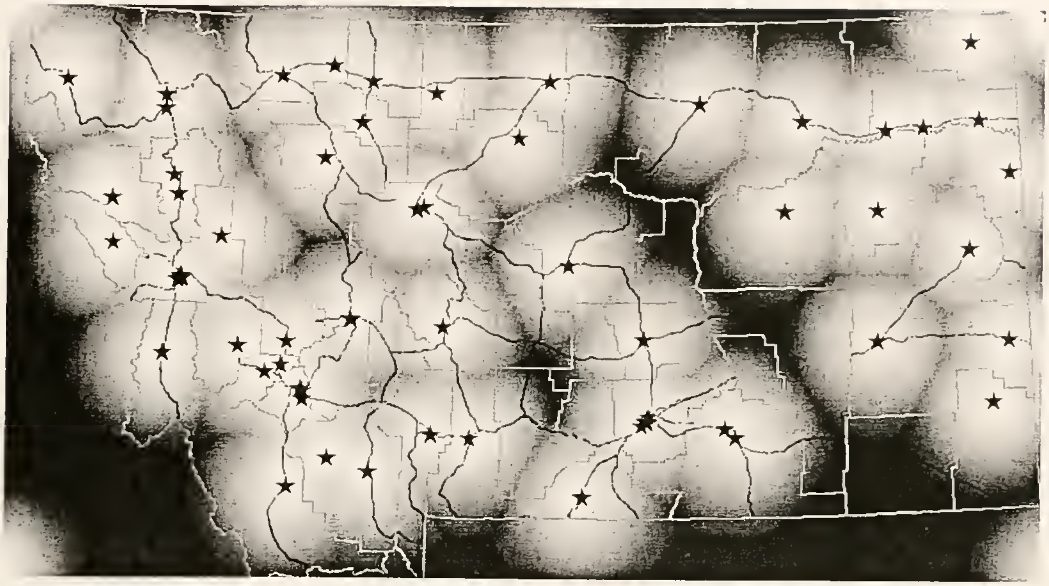


GIS analysis procedures were used to determine which state land parcels were contiguous to other state trust land parcels forming blocks of land larger than 1 square mile in size (See Figure 1) . These contiguous parcels were carried in the GIS database but were not used in any acreage calculations or growth potential maps. All neighborhood analyses used individual trust land parcels ignoring any contiguity between parcels.

Distance and acreage measurements for each state trust land parcel

Initially, a unique identifier was assigned to each state trust land parcel. The original data set included 12,573 records, some represented multi-part shapes. Multi-part shapes were converted to single part, expanding the number of unique polygons to 13,693. Detailed GIS steps used in the analysis are included in the Federal Geographic Data Committee (FGDC) compatible metadata for the parcel layer. Distance to features was measured for multiple attributes. These measurements involved creating a proximity grid for each source layer and overlaying the DNRC parcel layer to assign the average distance to the selected feature. All of the distance measurements were Euclidian straight line distance. The figure below shows one examples of these proximity grids. For simulated floodplains, a component of the development determination, the distance was modified by slope to adjust for a narrower floodplain in steeper areas.

Figure 2 Euclidian distance to hospitals



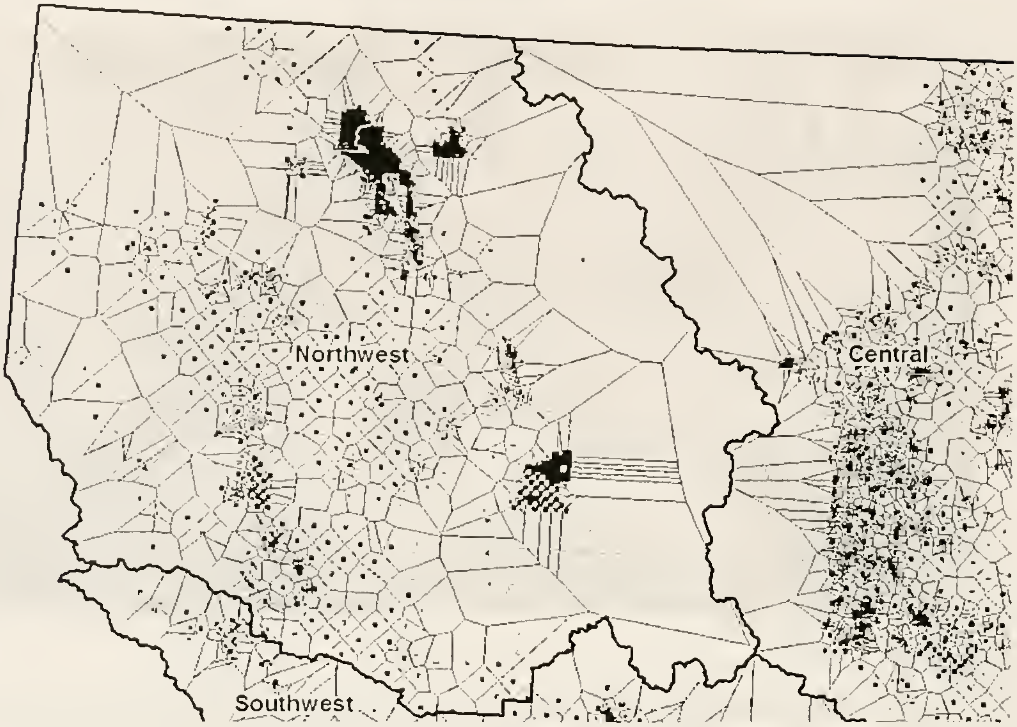
A series of proximity analysis was conducted on multiple data layers from public and commercial sources to contribute to an additive model distinguishing the relative potential for residential and commercial/industrial development for each trust land parcel. These analyses resulted in continuous surfaces to selected features stored as a series of ESRI Grids with 90 meter resolution covering the state of Montana. Zonal statistics were calculated for each distance grid and the resulting mean value posted to the state trust land parcel layer.

Neighborhood analysis for state trust lands

The neighborhood around each state trust land parcel was defined using Thiessen polygons. Thiessen proximal polygons have the unique property that each polygon contains only one input point, and any location within a polygon is closer to its associated point than to the point of any other polygon.

Analysis involving residences used the CAMA property indicator identifying which parcels had a residence or mobile home. The year the residence was built was also derived from the CAMA database to determine those built in the last five and ten year increments. The CAMA data is oriented around property tax purposes, unlike the census which is focused on population. The CAMA data only recorded the presence or absence of a residence and does not indicate the number of residences on a parcel if more than one existed. Commercial entities like apartments were listed in the commercial CAMA data, but the residential counts used in this study undercounted residences on parcels with multiple occurrences.

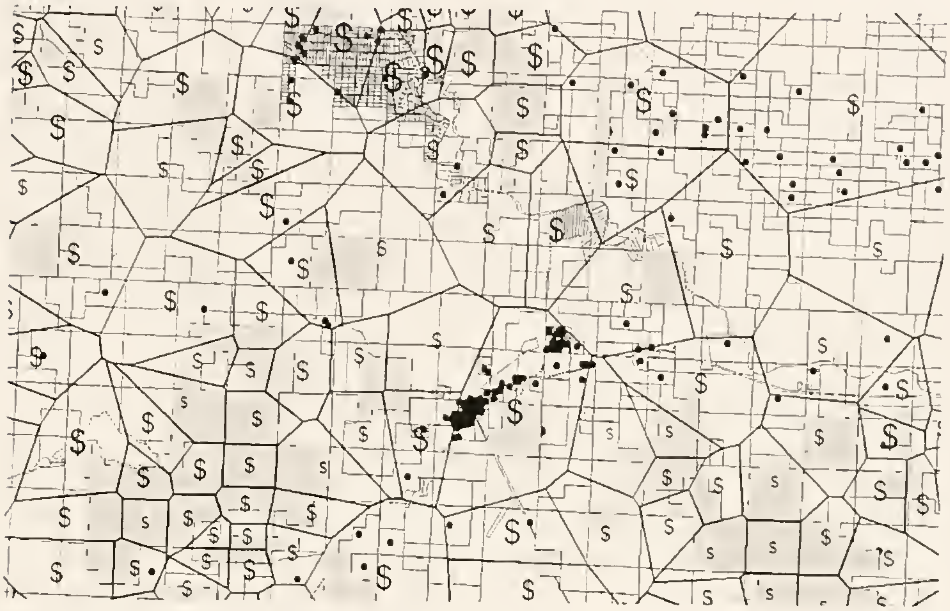
Figure 3 Thiessen polygons defining trust land parcel neighborhoods



Attributes measuring household differences between 1990 and 2003 and projected differences between 2003-2008 were calculated by extracting ESRI Business Analyst data by census block group with the growth rates assigned to each block group. These were converted to ESRI grid layers with 90 meter resolution cells, each assigned the growth rate for that census block group. The mean value of the growth rate grids were then calculated for each Thiessen polygon from these grids. This provided the basis to calculate an average rate of growth or decline in residential housing in the area around state trust land parcels in the recent past and predicted in the near future.

The cadastral parcels were also used as the unit of analysis for measurements provided to Dr Jackson as the basis for regression models on the economic predictions for residential development. In addition to the variables already described, parcels larger than 1 acre were identified and summarized by county and land office.

Figure 4 Regression models for economic predictions based on CAMA economic and growth variables



Subsequently, parcels greater than 1 acre and smaller than 25 acres were identified. The total final land value, total final building value and total cost value of the improvements for each parcel from the CAMA database and total count of parcels with a dwelling and residence from residential parcels were summed by county and land office.

Relative potential for residential development in areas near DNRC trust land parcels

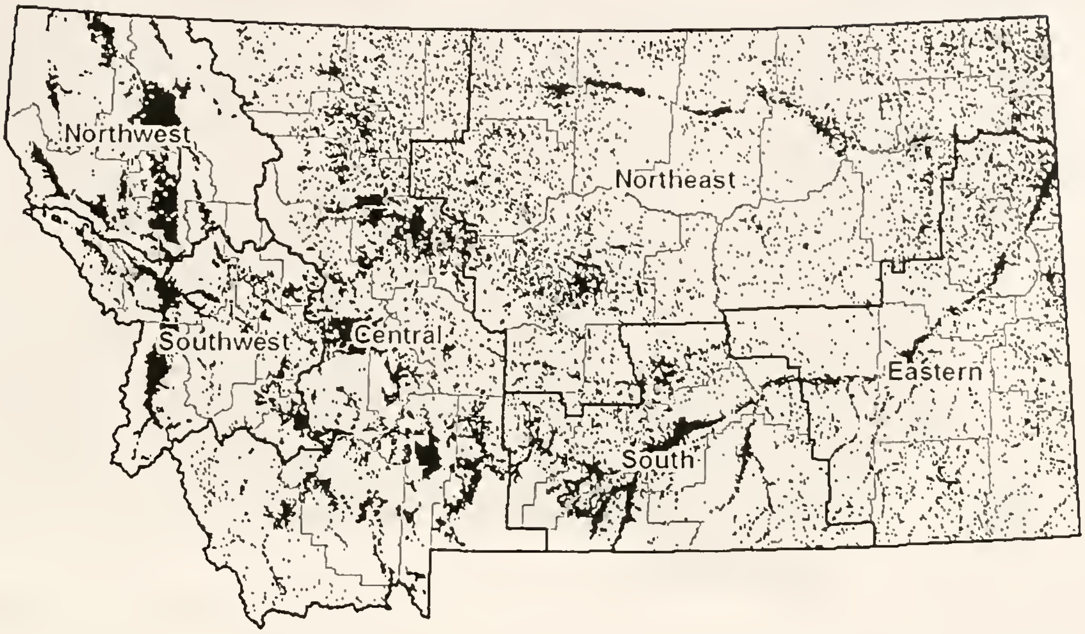
The variables used to summarize the likelihood of residential development were based on previous research and are the variables that are most highly correlated with development in previous studies. Quantile measurements were used to divide each variable into high, medium and low classes. The acreages were then summed for these classes. The simple additive model used to determine the final quantile class values were groupings of these quantile classes. A detailed statistical analysis of the descriptive geostatistical metrics derived in this project was not conducted. Building a suitability index created from a combination of statistical models (logistic regression, regression tree and cluster analysis) could be used to fit an equation to more accurately predict residential development or quantify the relationship of the variables to potential development. This type of analysis could be accomplished using the final data layer we created as part of the more detailed analysis required at the site level. For this analysis, the acreage summaries were tabulated on nominal and ordinal measurement scales, but the underlying data base attached to each state trust land parcel includes continuous variable measurements for future analysis.

The data provided in Table 3 shows the total acres of state trust land with higher potential to be developed in each DNRC land office. The definition of "higher potential" is a relative term. In this instance it is not the result of a statistical model, but is the lands in the highest class of all state trust lands, by each land office, split into four quantiles, grouped into three classes resulting from summing a series of covariate variables commonly agreed to be related to rural residential development. The data do not reflect or infer causation, they were summarized from variables that have been identified in rural residential development research in Montana as highly correlated. In some instances they may be responsible for growth, but in others they could result from the effects of growth. DNRC staff chose to analyze each land office individually, rather than on a statewide basis. For example, features outside of a land office were not measured even if they were closer to a state trust land parcel.

This project examined several studies of rural development and selected common variables from two local studies for this analysis. One was done in the Greater Yellowstone Ecosystem (GYE) (Hernandez, 2004), and the other in the Bitterroot Valley of Western Montana (Christensen, 2002). The primary reason were selected these two studies was the fine scale of geographic granularity of their analysis. The Hernandez study used 1 square mile sections of land and property tax data and the Christensen study used private land parcels and property tax data. Most other analysis of human settlement and growth patterns utilized coarser geographic data as the unit of analysis. These two studies occurred in areas experiencing the fastest growth in Montana and are likely not representative of all areas in the state, particularly the rural agricultural portions of the eastern and central portion. These two studies do reflect the high growth portions of the state which are ranked relatively more likely to experience future rural residential development.

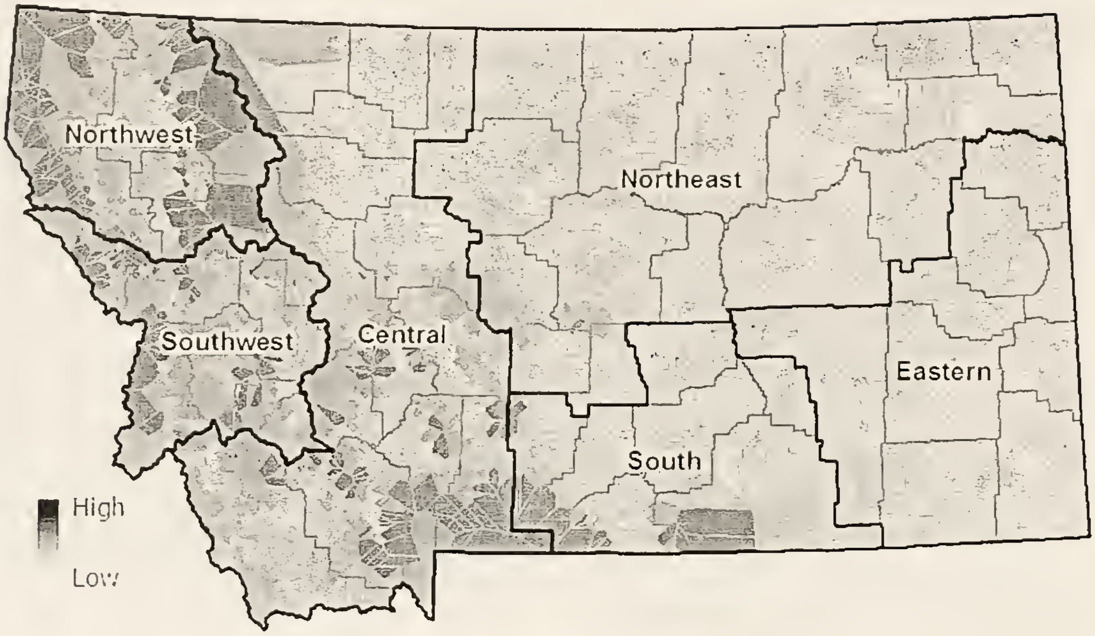
The sign or direction of the correlation was generally similar between the two studies for almost all variables. Only a few attributes had conflicting results. Those that were in conflict regarding the direction (positive or negative) of the relationship were not included in the summary results.

Figure 5 Housing density - each dot represents a parcel with a residence



Among the strongest correlation in both studies was existing density of development and encroachment, showing a positive correlation to future rural residential development. Variance in elevation was a significant variable in the Hernandez study, and in the Christensen study, they measured “viewshed” characteristics, including number of peaks in sight from each parcel. Transportation variables were strongly correlated in both studies, with road density a positive relationship, and a negative relationship for travel distance to town and distance to a state or county road. In the service class of variables in the Hernandez study driving distance to airports and hospitals were the most highly correlated negative relationship, and similar patterns were found in the Bitterroot with distance to schools, service businesses and all businesses .

Figure 6 Elevation variance positively correlated with residential growth



Distance to major steams, rivers and water bodies was negatively correlated with growth in both studies, there was less development farther away from perennial and intermittent water sources.

Figure 7 Services including airports and hospitals were important predictors of residential growth

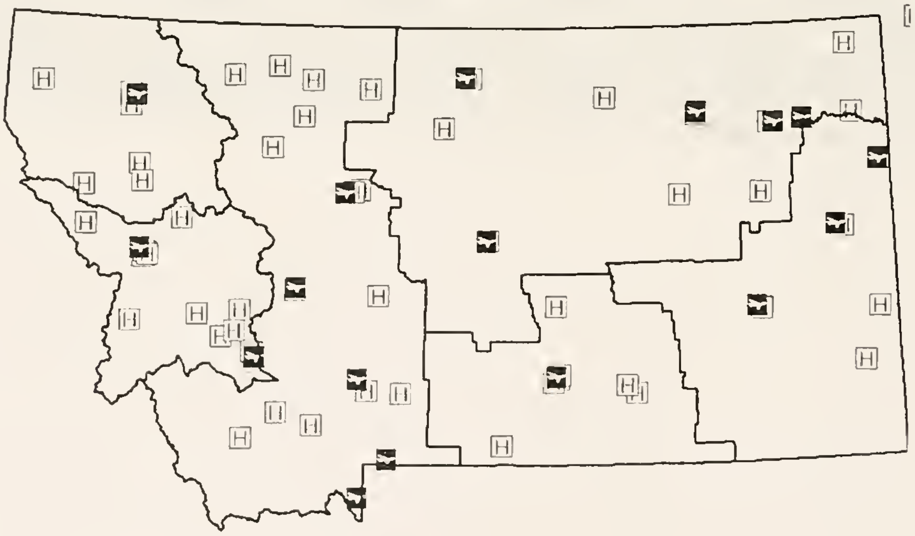


Figure 8 Household growth rates by census block group 1990-2000

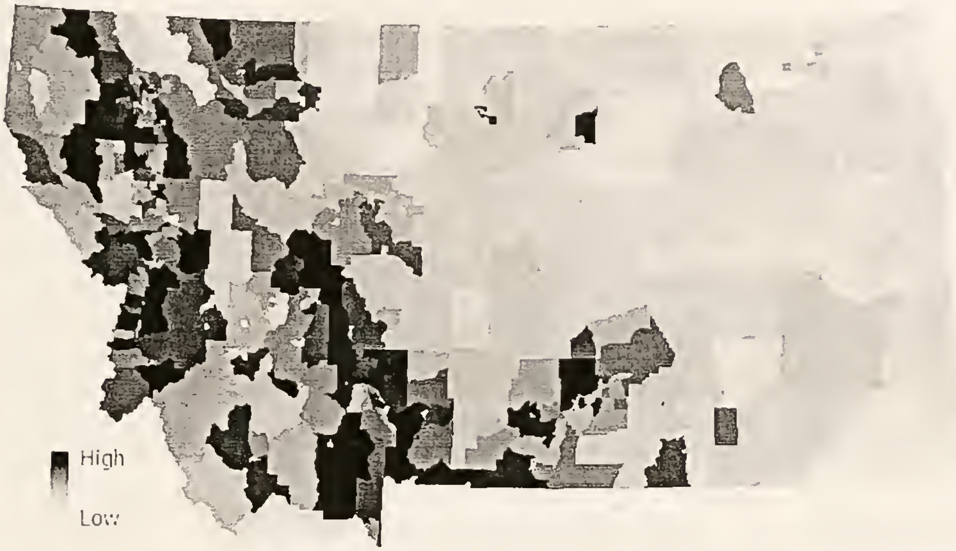


Figure 9 Road density per square mile

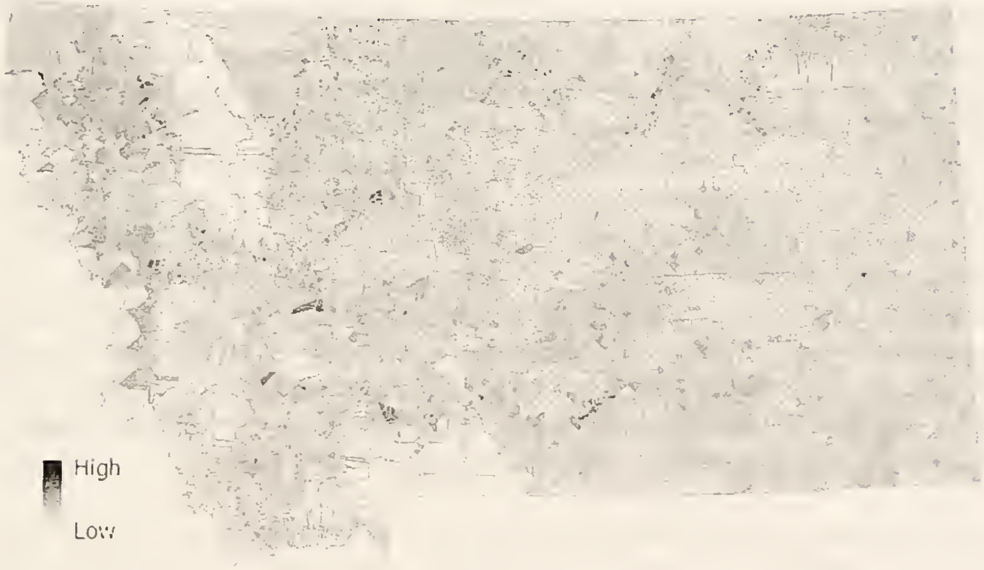
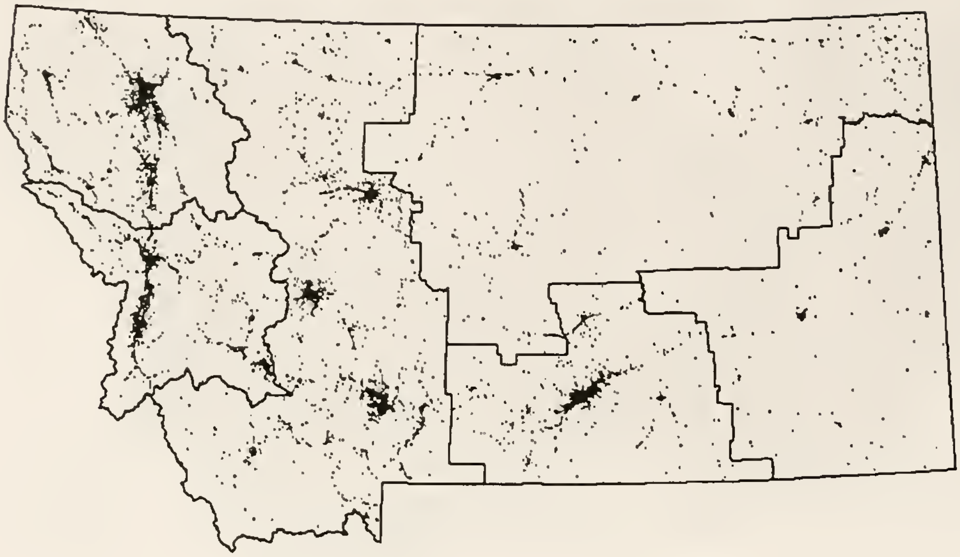


Figure 10 Commercial activity - each point is a Montana business



There were mixed results in the correlation of public lands and conservation easements to growth and development. In the Hernandez study near the GYE there was a strong negative relationship between rural residential growth and distance to National Parks (development decreased as distance from National Parks increased), but the relationship was positive for all public lands and conservation easements (area near towns that were further from public lands and easements tended to experience more growth). The Christensen study showed negative relationships for proximity to all categories of public lands and easements. The Hernandez study provides a possible explanation for their results attributing it to the vast difference in types of public lands. Due to these discrepancies, the proximity measures calculated for trust land parcels in the summed model for trust lands were not used. The Hernandez study examined a few variables that were not measured in the Christensen study, such as educational attainment and agricultural productivity that were strongly related to growth in the GYE area. These were not measured in the examination of state trust land parcels.

Using the two site specific Montana studies, the measurable attributes which best fit the residential growth models were selected. Acreages were calculated for the attributes, listed in Table 2 in italics, individually for the immediate neighborhood around each state trust parcel (defined by Thiessen polygons), or the distance measurement directly to the state trust land parcel, either based on metrics of total counts, average density, or proximity distance measurements, and classified each into three quantiles, by land office. High, medium, and low class values were assigned: High=>75%, Medium=25-75%, Low=<25%. Those variables that were negatively correlated were inverted to standardize the subsequent comparison in an additive model. As a result all variables were assigned a standardized quantile ranking based on the indication of likelihood of development.

Table 2 Attributes Included in the Model – All Were Classed into Quantiles

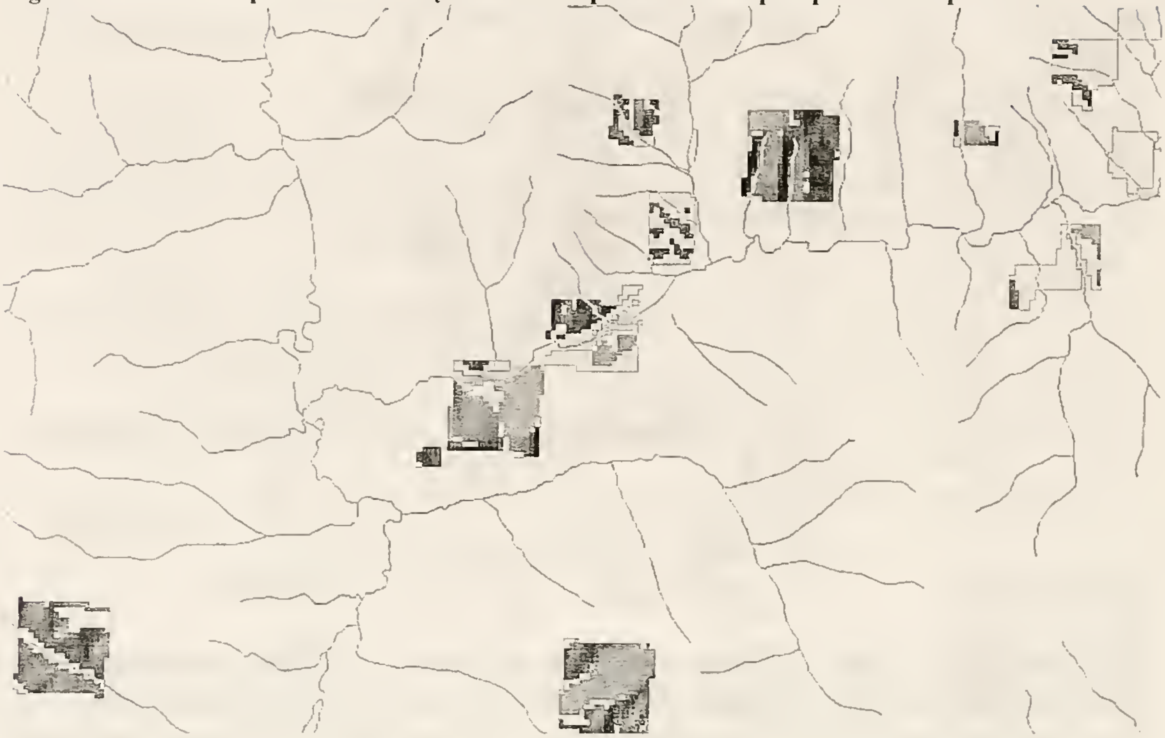
-Q_D_RES	Distance to nearest residence
-Q_D_RES5	Distance to nearest residence in neighborhood built in the last 5 years
-Q_D_PSTRM	Distance to nearest perennial stream
-Q_D_ROADS	Distance to nearest state or county road
-Q_D_BUS	Distance to nearest commercial business (by address)
-Q_D_SHOP	Distance to nearest major shopping center
-Q_D_COMM	Distance to nearest commercial parcel
-Q_D_HOSPITAL	Distance to nearest hospital
-Q_D_USGSAI	Distance to nearest airport serving more than 250 passengers
+Q_CNT_RES	Number of residential parcels in neighborhood
+Q_ROAD_DEN	Average road density in neighborhood
+Q_DH9000	Increase in households in neighborhood between 1990-2000 census
+Q_DH0308	Predicted increase in households in neighborhood between 2003-2008 (ESRIBis estimate)
+Q_ELEVSTD	Standard deviation of elevation in neighborhood

These rankings were then summed across all ordinal scaled variables and the results were again classified into four quantiles, and assigned into three classes using the same percentage classes (High=>75%, Medium=50-75%, Low=<25%) . The upper quantile of the composite highly likely parcels was then cross referenced against the acres potentially developable within that parcel and the resulting acres summed by land office to create the results in Table 3 and depicted in Figure 14.

Developable portions of DNRC parcels

In addition to the potential for residential development, the approximate acreage of trust land parcels likely to be developable was also calculated, subtracting out portions of parcels with physical constraints and classifying them as unlikely to be developed for residential purposes. As a practical rule of thumb, a slope limit and simulated floodplain was used to define these areas. The slope grid was reclassified into slopes more than and less than 25%, the cutoff for septic system regulations in Montana.

Figure 11 Trust land parcels less likely to be developed due to steep slopes or floodplain

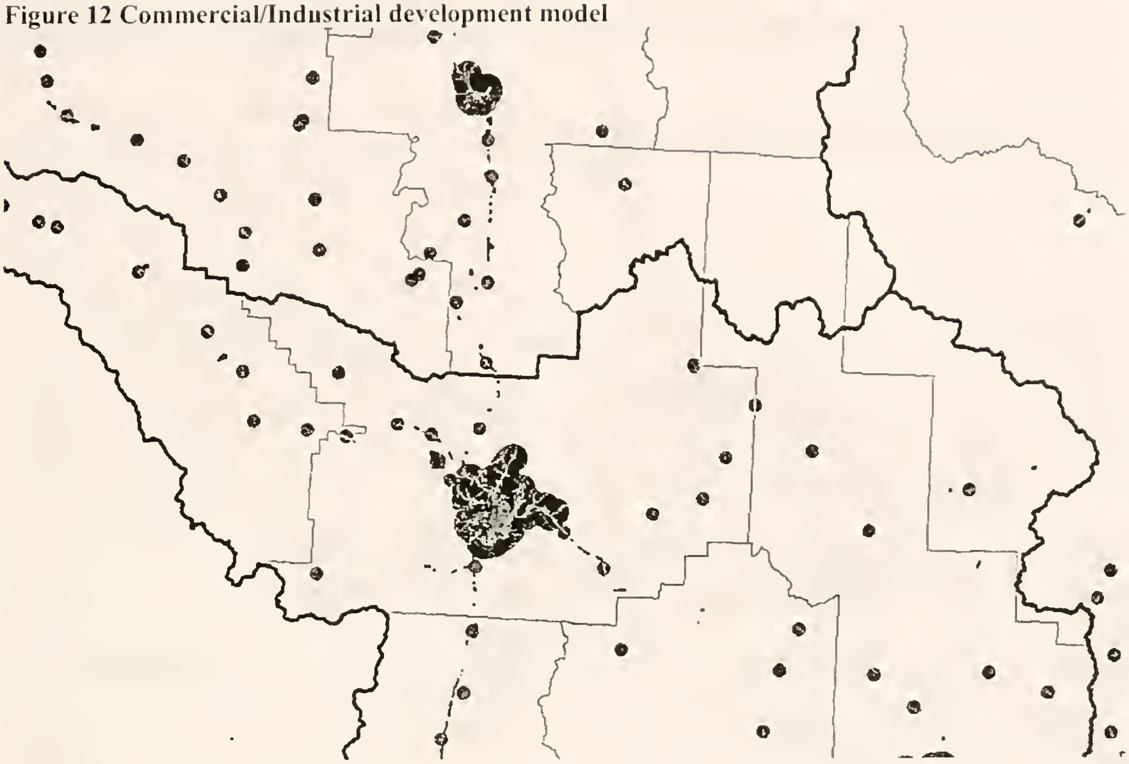


As described in the data section, floodplain was simulated using the perennial streams identified in the National Hydrologic data set mapped at a scale of 1 to 100,000. Buffers of ¼ mile were derived around these streams and modified with an inverse relationship by the slope grid, making the simulated floodplain buffer narrower where slopes were steeper. The union of these two analysis grids was then intersected with the DNRC parcels converted to a grid with the same cell size. The resulting grid, splitting the trust land parcels into two classes, developable and non-developable was then used to calculate acreages in each land office.

Relative potential for commercial and industrial development

No studies similar to the residential model research in the previous section were located for commercial and industrial development potential.

Figure 12 Commercial/Industrial development model

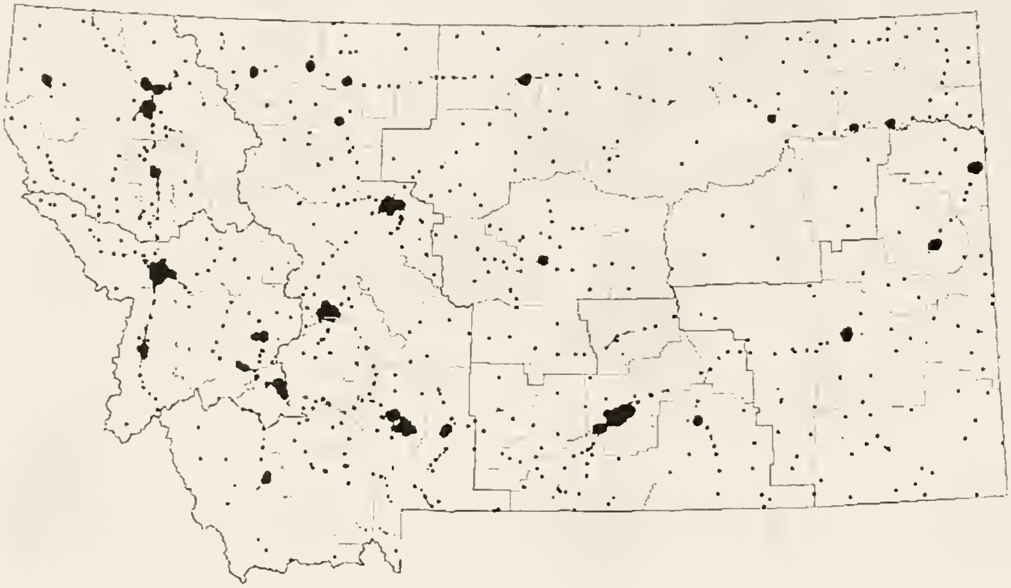


The model included the following components:

1) The Census 2000 layer from NRIS is a polygon layer of major cities in Montana derived from data from the Census Bureau. Some cities also have digital city boundaries and urban area maps, but variability in availability and standards for creation of the digital data precluded use of more detailed local data. A Euclidian distance grid was created based on the distance from the external boundary of the major city polygon layer. This was subsequently resampled to two classes, those within or outside a 2 mile buffer of a major town.
2) An identical analysis was run on areas within and outside a 1 mile buffer of the 624 largest towns in Montana (from NRIS "Montana towns" GIS layer).
3) Separate proximity distance grids were created for the areas within 1/4 mile of a major highway and within 1/4 mile of an existing commercial or industrial parcel from property tax database
4) The resulting four grids were summed, and all intersecting areas were kept in the model. The results were overlaid with developable lands, slopes greater and less than 25% and outside of simulated floodplain (the same map layer as the residential model was used) to determine developable portions of commercial and industrial parcels. The resulting statewide grid was overlaid on the land offices and the acreages of commercial/industrial lands were calculated for each land office. We also overlaid the results with all trust parcels and selected the subset of trust parcels that included at least 2 acres of commercial or industrial land in the model.

When the analysis was complete, final commercial/industrial grid was overlaid with the developable residential land to derive an overlap map. The acreage totals of this analysis were subtotalled by land office.

Figure 13 Commercial model - all areas in Montana



DNRC land office summarization

The analysis described in the previous sections was conducted on finer grained scaled data layers. The final step in the analysis was to summarize the data to the DNRC land office level suitable for the analysis in the programmatic GIS. The source data will have utility beyond the current analysis for subsequent site analysis in areas smaller than the land office administrative boundaries.

The parcel data was tabulated for each land office and summarized.

- Categorize values for each variable into three standard deviations and assign class values
- Summarize acreage of state trust land more and less likely to be developed for residential uses
- Summarize acreage of state trust lands more likely to be developed for commercial and industrial uses
- Acreage summarization within DNRC land office regions
- Prepare spreadsheet of data metrics for each state trust land parcel

Analysis Results

The results of the GIS analysis are included below. Figure 14 through Figure 16 State trust land parcels in lower quantile of residential development show the geographic distribution of each of the quantile categories.

Table 3 All Developable acres by land office

AREA OFFICE	QUANTILE	COUNT	TOTAL ACRES	DEVELOPABLE ACRES
CLO	3	680	228,261	167,773
CLO	2	2,059	629,700	506,089
CLO	1	1,242	403,704	327,880
CLO Subtotal		**3,981**	**1,261,665**	**1,001,742**
ELO	3	326	128,015	114,261
ELO	2	1,154	577,769	534,260
ELO	1	518	274,029	261,357
ELO Subtotal		**1,998**	**979,813**	**909,878**
NELO	3	997	317,478	284,097
NELO	2	2,877	1,079,331	995,784
NELO	1	1,601	617,661	573,225
NELO Subtotal		**5,475**	**2,014,470**	**1,853,106**
NWLO	3	139	42,158	28,268
NWLO	2	387	162,670	82,074
NWLO	1	256	111,357	42,516
NWLO Subtotal		**782**	**316,184**	**152,858**
SLO	3	157	62,799	53,959
SLO	2	435	218,197	195,160
SLO	1	253	111,969	105,726
SLO Subtotal		**845**	**392,965**	**354,845**
SWLO	3	121	37,199	19,027
SWLO	2	321	124,046	72,017
SWLO	1	170	75,259	51,333
SWLO Subtotal		**612**	**236,504**	**142,377**
TOTAL		13,693	5,201,601	4,414,806

Figure 14 State trust land parcels in upper quantile of residential development

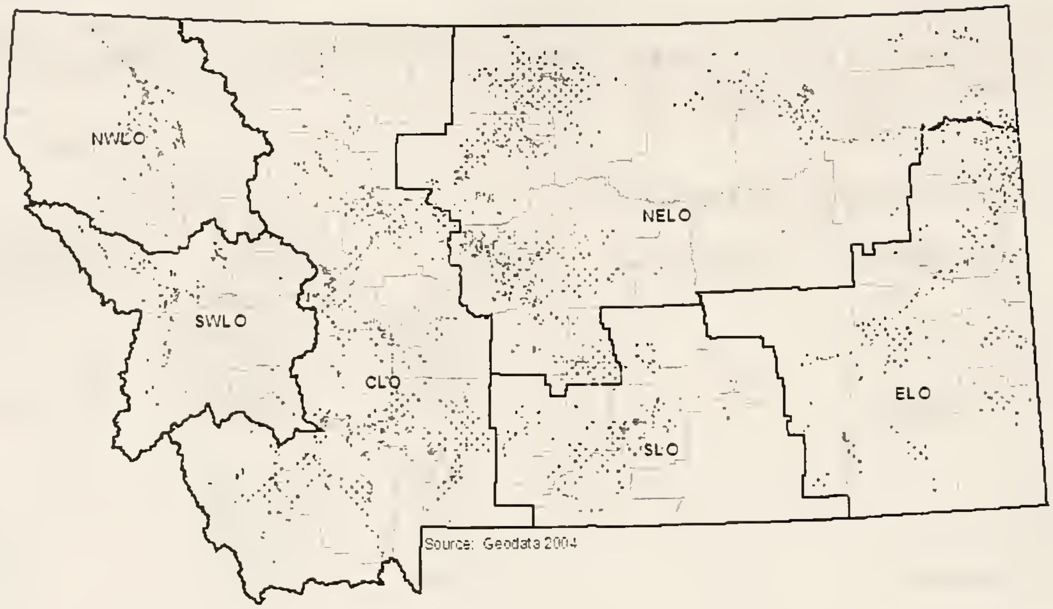


Figure 15 State trust land parcels in middle quantile of residential development

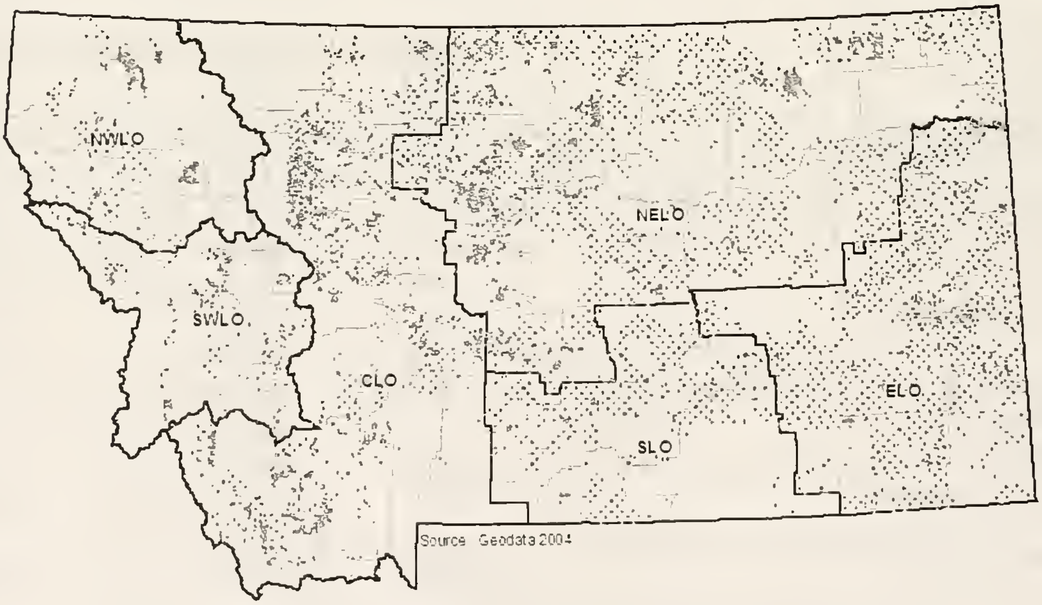
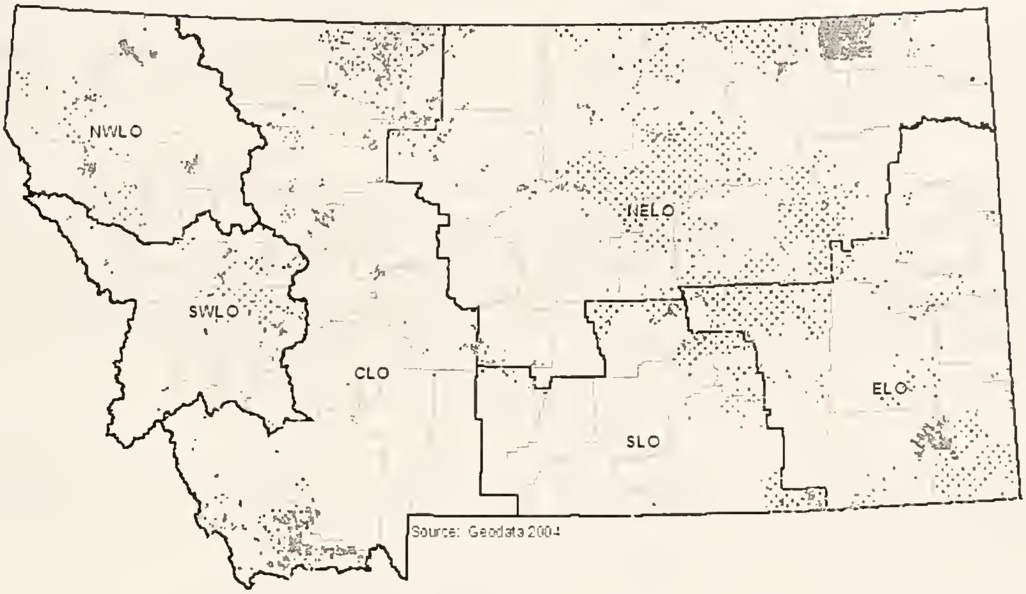


Figure 16 State trust land parcels in lower quantile of residential development



Source: Geodata 2004

Table 4 shows all commercial/industrial potential land acreages by land office in two categories (developable and non-developable). Table 5 shows the portion of the commercial/industrial potential land acreages that fall within DNRC developable parcels, also by land office.

Table 4 Acreage of all commercial and industrial parcels developable and not developable

All Commercial & Industrial	Acres
SWLO Develop	307,622
SWLO Non develop	69,292
SLO Develop	292,668
SLO Non Develop	8,526
NWLO Develop	270,582
NWLO Non Develop	29,572
ELO Develop	244,220
ELO Non Develop	1,424
CLO Develop	663,688
CLO Non Develop	45,370
NELO Develop	395,630
NELO Non-Develop	4,572

Table 5 Developable acreage of commercial and industrial trust land parcels

DNRC Developable Commercial & Industrial	Acres
SWLO Develop	6,052
SLO Develop	9,104
NWLO Develop	6,940
ELO Develop	9,336
CLO Develop	16,330
NELO Develop	17,220

References

Hernandez, P.A, and advisors Hansen, A.J., Rasker, R., Maxwell, B (2004) “Rates and Drivers of Rural Residential Development in the Greater Yellowstone”, Masters Thesis, Montana State University

Christensen, N. A., Landres, P. B. (2002). “Modeling residential development behavior in the urban/forest interface with the Bitterroot National Forest in Montana.” Book of Abstracts, 9th International Symposium on Society and Resource Management: Choices and Consequences – Natural Resources and Societal Decision-Making, June 2 –5, Indiana University, Bloomington.

APPENDIX C

GIS Data Report

Geographic Information Services and Consulting
assisting with geographic information systems analysis and support for:
Programmatic Environmental Impact Statement for
DNRC State Trust Land Special Uses Division

Prepared for DNRC State Trust Land Special Uses Division

Prepared by Geodata Services, Inc.
104 South Ave. E.
Missoula MT 59801

May 25 , 2004

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Introduction

This report details the geographic information system analysis and support for strategic planning associated with State Trust Lands. The GIS services involved data procurement, processing, analysis, and graphic support for DNRC staff and contracted researchers working on economic and social assessments of state trust lands. Geodata Services, Inc. developed GIS layers combining commercial and residential property with state trust land parcels and ancillary geospatial data in order to provide a foundation for assessing the relative potential of state trust lands to allow commercial, industrial, residential or other special uses. GIS analysis was also used by Dr Jackson in the financial analysis using a nearest neighbor approach, combining Montana Department of Revenue land appraisal values, with land use codes, residential housing density, development rates by decade, proximity measures to commercial and industrial properties. Individual properties were combined into aggregate summaries by county for acreage classifications of residential, commercial and industrial properties.

This appendix report is divided into the following sections:

1. Data sources and summary description
2. Methods and analysis procedures
3. GIS deliverables
4. Analysis results

Data Sources and Summary Description

Data sources

Geographic Information Systems (GIS) was used in this project to calculate geospatial variables for subsequent analysis and modeling of commercial and residential potential of state trust lands. Base layers include the following layers and sources and their accompanying summary description and synopsis of their use.

Montana cadastral ownership maps maintained by the Department of Administration.

This layer provided the base for all private residential land and commercial properties in Montana. It included coverage in every county, though some counties were still incomplete. The Information Services Division of the Montana Department of Administration provided Geodata with a statewide geodatabase of the parcel layer based on the July, 2003 status of the ownership parcels. The databases for this system are updated twice each year. This geodatabase with approximately 800,000 parcels was used for two portions of the analysis, measuring distances to residential, commercial and industrial properties from each DNRC trust land parcel, and calculating housing density, year built, within the neighboring areas around each trust land parcel.

The parcels included a geocode, which is an identification number intended to be unique for each parcel. The Department of Revenue Computer Assisted Mass

Appraisal System (CAMA) included the residential and commercial property tax system. A centroid point was derived for each parcel and these points were overlaid on the land office polygons and each parcel assigned to a land office. The parcels and centroid points were linked to the residential CAMA database via the geocode identifier. A similar process was used to link the parcels to the commercial CAMA database for commercial and industrial parcels.

Digital Elevation Model

A statewide digital elevation model (DEM), with a 30 meter resolution was obtained from the Natural Resource Information System at the Montana State Library. To facilitate subsequent processing, the DEM was resampled to a resolution of 90 meters. A slope map, calculated in percent, was created from the resampled DEM. The slope map was also reclassified to identify slopes greater than 25% which were too steep for septic systems, forming a portion of the identification of developable areas. It was also used as a modifier in the floodplain surrogate buffer. The DEM was also used to derive a shaded relief grid, used as a backdrop for presentations and map graphics.

State Trust Land Parcels

The state trust land GIS layer used for this analysis was provided by DNRC GIS staff. Neither DNRC staff, nor Department of Revenue or Department of Administration staff had integrated state CAMA geocodes into the state trust land database or digital GIS file. In spite of these limitations, this GIS data layer was used as it was without additional modification as the base state trust land layer for this project, and without trying to match the parcels spatially to the cadastral GIS layer to match geocodes. The GCDB survey control that the state trust lands layer was based on was also updated. As a result of these considerations there were small anomalies and geographic slivers resulting from the overlays that we were forced to accept in the course of analysis. Overall, they had minimal impact on the outcome. Each DNRC trust land parcel was also used as the source for Thiessen polygon neighborhood delineation, which were the neighborhood polygons used in this analysis for variables measured at the neighborhood level.

Roads

Broad coverage of roads was available at a scale of 1:100,000 based on Census based Tiger files. The public domain files were available from the Montana state library. This project used the ESRI nationwide street database in ArcGIS StreetMap USA from Geographic Data Technology, Inc. (GDT) commercially enhanced street files, built on this Tiger base but enhanced with more recent development and more roads. This street database enhances TIGER 2000 source data and provides a nationwide base map for routing and drive time analysis. Although many small rural roads and forest roads are not on these layers, they include most paved county roads and generally represent the development potential for most areas. Roads were used in the proximity analysis for potential development, and in the economic valuation nearest neighborhood analysis. The GDT roads layer is a proprietary commercial GIS layer.

Business Locations

ESRI Business Analyst software includes a national database of more than 12 million U.S. businesses from InfoUSA, which was used to supplement the Montana cadastral data and provide an alternative measure of commercial site proximity. These data include sites not available through the Montana commercial CAMA data. The CAMA data was based on property ownership, the InfoUSA was based on business address. Between these two commercial geospatial map layers, most commercial activity in Montana were mapped at a level of detail suitable for nearest neighbor analysis at a fine grained scale. The ESRI Business Analyst data also included shopping center data. The National Research Bureau tracked the following information on nearly 14,000 shopping centers with more than 100,000 square feet of gross leasable area (GLA) across the United States: alphabetical listing, center name, metropolitan statistical area (MSA), city, county, market positioning strategy, space availability, planned/proposed/new centers, expanding/renovating centers, major owner, leasing agent, and management. These were provided by point location based on address, and used in the proximity analysis. This database did not contain any shopping centers in the Eastern Land Office. They were also used to extract hospital locations, a key variables in the residential growth analysis. The InfoUSA and NRB GIS layers are a proprietary commercial GIS layers.

Airports

This data set includes airports in the United States, Puerto Rico and the U.S. Virgin Islands. The data were derived from an extract of the Public Use Airports database of the National Transportation Atlas Databases-2001 (NTAD-2001), published by the Bureau of Transportation Statistics, Department of Transportation. This map layer included airports in the 50 United States, Puerto Rico, and the U.S. Virgin Islands with enplanements greater than or equal to 250 passengers per year. There were 21 airports in the database in Montana, and all were used in the analysis.

Streams

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order. The NHD is based upon the content of USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD supersedes DLG and RF3 by incorporating them, not by replacing them. Users of DLG or RF3 will find the National Hydrography Dataset both familiar and greatly expanded and refined. It was initially developed at a scale of 1:100,000. This stream layer was used for distance measurements.

Demographic Data

ESRI Business Analyst software contains over 300 demographic variables. This study used the household change between 1990 and 2000 and the predicted change between

2003 and 2008 as part of the analysis for potential residential growth and for the financial nearest neighbor analysis. The geographic units for this analysis was census block groups. The ESRI Business Analyst layer is a proprietary commercial GIS layer.

Public Land Ownership

The NRIS program at the Montana State Library maintains a 1:100,000 scale public land ownership and stewardship layer. This layer was used for distance measures to public lands and to extract state trust land areas under some form of conservation easement. This layer was not regularly maintained, it was not up to date everywhere in the state, and it did not include county and municipal lands. However, it was the best composite layer for public lands and was used as is with no further checks or modifications. The Montana Cadastral map layer and CAMA included public land ownership, but tended to lump all federal and state lands into single categories, so the parcel layer was not used in this study to identify public lands used in subsequent proximity analysis.

Floodplain

Another portion of the developable land base identification was based on floodplain areas, which were less likely to be developed. Digital versions of floodplain maps, developed and maintained by the Federal Emergency Management Agency were available for portions of 17 Montana counties, representing a small percentage of the total area. To simulate floodplains consistently throughout Montana a one-quarter mile buffer zones around all perennial streams (based on the National Hydrologic Data at a scale of 1:100,000)was weighted inversely by slope to create a variable width estimated floodplain that was narrower where slopes were steep.

Miscellaneous Layers

For general mapping and location reference, county, state, river, lakes, towns and cities were required. This project used layers provided by NRIS, typically at the 1:100,000 scale or smaller.

DNRC field offices and regions

Field office boundaries were acquired from DNRC GIS staff in digital form and used as is with no further modifications.

GIS Deliverables

The primary deliverable product for this contract was a GIS layer of state trust land parcels with accompanying database containing the attributes measured in this study and metadata and documentation on the map layers and analysis process. The DNRC land office boundaries layer is also included as a deliverable. This layer was provided by DNRC and no changes were made to it. The following attributes were developed and included in the state trust land parcel database:

Distance and proximity

Distance measurements from state trust land parcels to variables related to residential growth

- Residential parcels with existing residences in the Montana cadastral property database (All residences /5 yr/10 yr)
- Commercial parcels in the Montana cadastral property database
- Industrial parcels in the Montana cadastral property database
- Commercial businesses in the InfoUSA database
- Shopping centers in the NRB shopping centers database
- Conservation easements
- Perennial streams
- Public land
- Roads
- Hospitals
- Airports with emplanements greater than or equal to 250 passengers per year

Acreage summaries of selected characteristics for each state trust land parcel

- Floodplain
- Slopes greater than 25%
- Developable area (slopes < 25% and not floodplain)
- Road access
- Contiguity to other state trust land parcels forming blocks of land larger than 1 square mile in size.
- Standard deviation of elevation
- Road density

Acreage summaries of selected characteristics for the neighborhoods surrounding each state trust land parcel (Thiessen polygons were used to define neighborhoods and are defined as the area that is closest to the parcel centroid relative to all other parcel centroids)

  - Average value of the year residence built, year remodeled, effective year modifier, land value attributes, count of residences in neighborhhood, housing density per acre were derived to aid Dr Jackson to fit a regression model. Land value attributes and the count of commercial and industrial parcels were also derived.
  - Change in the number of households from 1990 to 2000 and the predicted annual change from 2003 to 2008

Summarization of quantiles

The values for the distance measurement variables and the neighborhood values were categorized into quantiles by each land office and assigned a high, medium, or low class value (High=>75%, Medium=50-75%, Low=<25%)

Residential Model Calculation

The residential model was calculated by summing the quantile values for the following attributes. Quantiles were calculated by each land office.

- Distance to the nearest residence
- Distance to the nearest residence built in the last five years
- Distance to the nearest perennial stream
- Distance to the nearest state or county road
- Distance to the nearest commercial business (by address)
- Distance to the nearest major shopping center
- Distance to the nearest commercial parcel
- Distance to the nearest hospital
- Distance to the nearest airport serving more than 250 passengers
- Number of residential parcels in the neighborhood
- Average road density in neighborhood
- Increase in households in neighborhood between 1990 and 2000
- Predicted increase in households in neighborhood between 2003 and 2008
- Standard deviation of elevation in neighborhood

Commercial/Industrial Model Calculation

The commercial/industrial model used the following components. Both commercial and industrial parcels were combined for this analysis. DNRC staff selected the final variables for the commercial/industrial models with GIS technical advice from Geodata Services. Unlike the residential model, which was run with each land office in isolation, the commercial/industrial model was run statewide for all trust land parcels. The longest measured distance required by the analysis was two miles, so the influence of an adjacent land office was not applicable. The model variables included:

1) All parcels within 2 miles of a major town (major towns were defined as those included on the Census 2000 layer from NRIS)
2) Within 1 mile of the 624 largest towns in Montana (from NRIS "Montana towns" GIS layer)
3) Intersection of areas within 1/4 mile of a major highway and within 1/4 mile of an existing commercial or industrial parcel from CAMA commercial property tax database
4) Results of steps 1-3 overlaid with slopes greater and less than 25%, and simulated floodplain to determine developable portions

The resulting grid map was processed with zonal statistics and summarized in the database for each trust land parcel. The deliverable layer for commercial included a selected subset of the trust land map layer that had at least 2 acres of commercial/industrial modeled land within it.

Data Attributes for State Trust Land Parcels

Table 1 Database attributes for state trust land parcels

Field Name	**Description**
AREA (sq meters)	
PERIMETER (meters)	
ACRES	
TWNRNGSEC	DNRC field
EMNT	DNRC field
SECTIONACR	DNRC field
SURFACEACR	DNRC field
SURFLEGAL	DNRC field
AREAOFFICE	DNRC field
UNITOFFICE	DNRC field
COMMENT	DNRC field
DATA_PRES	DNRC field
ACRE_DIF	DNRC field
SOURCE	DNRC field
EDIT_DATE	DNRC field
FORNONFOR	DNRC field
USGSFORNON	DNRC field
AUTO_ID	Unique id for each parcel
CO_NAME	County name - based on centroid point for parcel
Straight Line Distance Measurements (meters)	
D_res	Residences All – D(Dwelling) or M (Mobile)
D_res5	Residences Built in Last Five Years (2003-1998)
D_res10	Residences Built in Last Ten Years (2003-1993)
D_comm	Commercial All
D_ind	Industrial All
D_bus	Businesses All
D_shopctr	Shopping Centers All
D_cons	Conservation Easements All
D_pstream	Perennial Streams All
D_public	Public Land (DNRC parcels excepted)
D_roads	Roads All
D_Hosp	Hospitals All
D_Usgsair	Airports All
DNRC Parcels	
Floodplain	From NHD – perennial streams with ¼ mile buffer. Area in sq meters
Floodppct	Percent of parcel in floodplain
Slope	From 90 meter DEM – slope greater than 25%.

	Area in sq meters
Slopepct	Percent of parcel with slope greater than 25%
Develop	Area of parcel outside floodplain and less than 25% slope ("developable"). Area in sq meters.
Developpct	Percent of parcel outside floodplain and less than 25%
Rdaccess	1=Road Access / 0=No road access (with 100 meter buffer on roads) for developable portion of DNRC parcels
Contiguous	1=Contiguous / 0=Not Contiguous for DNRC parcels with shared perimeters with combined acreage greater than 660 acres
Elev_Stdev	Standard Deviation of elevation (from DEM)
Road_Densi	Density of linear features
Values from Thiessen polygons (neighborhoods)	
Av_yrblt	Average year residence built
Av_yrrmod	Average year residence remodelled
Av_yreff	Average effective year for residence
Av_totflv	Average Total Land Value for residence
Cnt_res	Count of parcels with a residence in each Thiessen polygon
Av_hd_acre	Average housing density/acre based on residence parcel size
Av_comland	Average Total Land Value for commercial parcels
Cnt_com	Count of commercial parcels in Thiessen polygon
Av_indland	Average Total Land Value for industrial parcels
Cnt_ind	Count of industrial parcels in Thiessen polygon
Dh9000	Household difference from 1990 to 2000
Dh0308	Household difference from 2003 to 2008
Dh9000a	Annual rate – household difference 1990 to 2000
Dh0308a	Annual rate – household difference 2003 to 2008
Quantile Values (calculated by each land office)	Low=<25%/Medium=25%-75%/High=>75%
Q_D_res	1=Low/2=Medium/3=High
Q_D_res5	1=Low/2=Medium/3=High
Q_D_res10	1=Low/2=Medium/3=High
Q_D_comm	1=Low/2=Medium/3=High
Q_D_ind	1=Low/2=Medium/3=High
Q_D_cons	1=Low/2=Medium/3=High

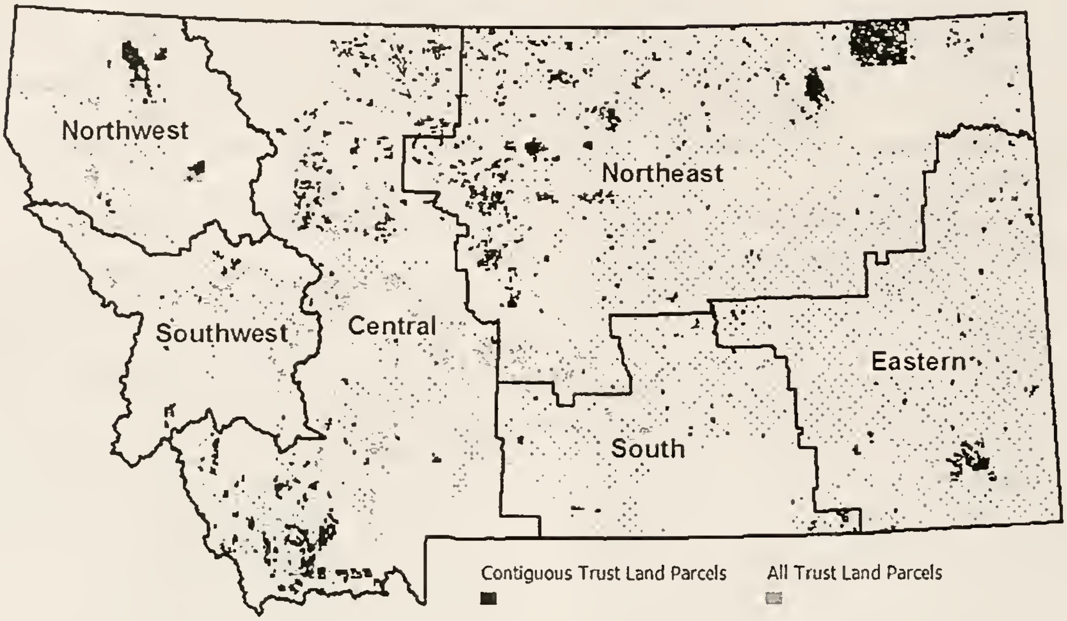
Q_D_pstrm	1=Low/2=Medium/3=High
Q_D_public	1=Low/2=Medium/3=High
Q_D_roads	1=Low/2=Medium/3=High
Q_D_bus	1=Low/2=Medium/3=High
Q_D_shop	1=Low/2=Medium/3=High
Q_Av_yrblt	1=Low/2=Medium/3=High
Q_Av_yrrmd	1=Low/2=Medium/3=High
Q_Av_yreff	1=Low/2=Medium/3=High
Q_Av_hdac (Avg Housing Density/Acre)	1=Low/2=Medium/3=High
Q_Av_r_val (Avg Total Land Value for Residence)	1=Low/2=Medium/3=High
Q_Av_c_val (Avg Total Land Value for Commercial)	1=Low/2=Medium/3=High
Q_Av_i_val (Avg Total Land Value for Industrial)	1=Low/2=Medium/3=High
Q_Dh9000	1=Low/2=Medium/3=High
Q_Dh0308	1=Low/2=Medium/3=High
Q_Dhosp	1=Low/2=Medium/3=High
Q_D_Usgsai	1=Low/2=Medium/3=High
Q_Elevstd	1=Low/2=Medium/3=High
Q_Rddens	1=Low/2=Medium/3=High
Q_Cnt_res	1=Low/2=Medium/3=High
Q_Fmodel	1=Low/2=Medium/3=High
Residential Land Model (calculated by each land office)	
Fin_Model	Q_D_res + Q_D_res5 + Q_D_pstrm + Q_D_roads + Q_D_bus + Q_D_shop + Q_D_comm + Q_D_hosp + Q_D_usgsai + Q_cnt_res + Q_rddens + Q_dh9000 + Q_dh0308 + Q_elevstd

Methods and analysis procedures

State trust land contiguity

Initial methodology proposed using clusters of trust land parcels, such as the state forests, as the trust land parcel source for neighborhood analyses. Although these clusters of trust land parcels were not used as the unit of analysis in the final methodology, state trust land parcels that were in contiguous blocks were identified for future analysis by dissolving the polygon coverage and determining which resulting parcels were larger than 660 acres (640 acres plus 20 acres to account for section anomalies). Some special uses may be possible in these areas that are not possible elsewhere. Parcels that are contiguous only on one corner, i.e. checkerboard ownership, were not considered contiguous for this step. It also would be useful to examine state trust lands contiguous to public land parcels. Some idea of contiguity was important, however, particularly in future site analysis following the programmatic GIS.

Figure 1 Contiguous trust land parcels larger than 1 sq mile

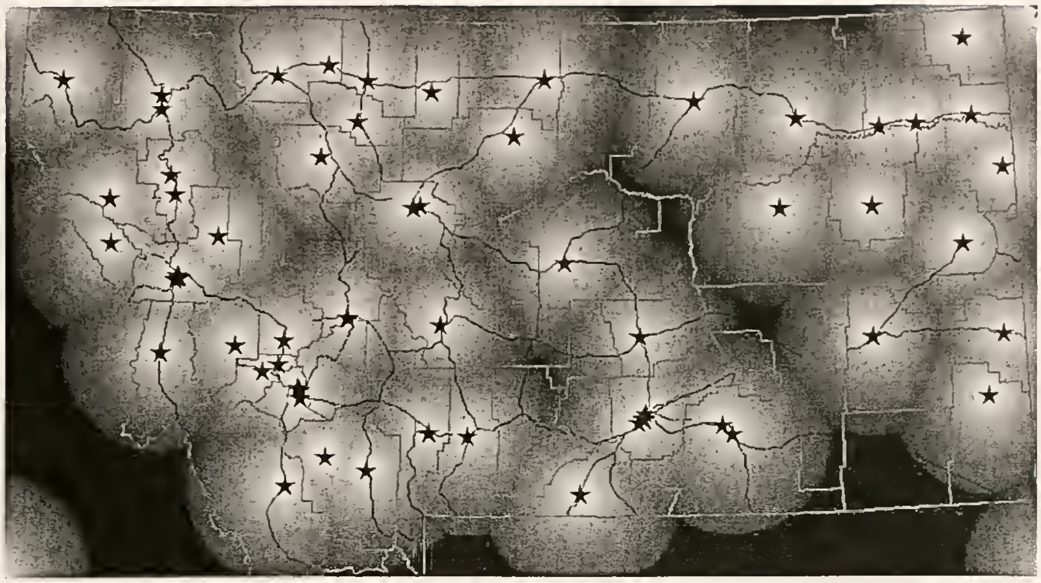


GIS analysis procedures were used to determine which state land parcels were contiguous to other state trust land parcels forming blocks of land larger than 1 square mile in size (See Figure 1) . These contiguous parcels were carried in the GIS database but were not used in any acreage calculations or growth potential maps. All neighborhood analyses used individual trust land parcels ignoring any contiguity between parcels.

Distance and acreage measurements for each state trust land parcel

Initially, a unique identifier was assigned to each state trust land parcel. The original data set included 12,573 records, some represented multi-part shapes. Multi-part shapes were converted to single part, expanding the number of unique polygons to 13,693. Detailed GIS steps used in the analysis are included in the Federal Geographic Data Committee (FGDC) compatible metadata for the parcel layer. Distance to features was measured for multiple attributes. These measurements involved creating a proximity grid for each source layer and overlaying the DNRC parcel layer to assign the average distance to the selected feature. All of the distance measurements were Euclidian straight line distance. The figure below shows one examples of these proximity grids. For simulated floodplains, a component of the development determination, the distance was modified by slope to adjust for a narrower floodplain in steeper areas.

Figure 2 Euclidian distance to hospitals



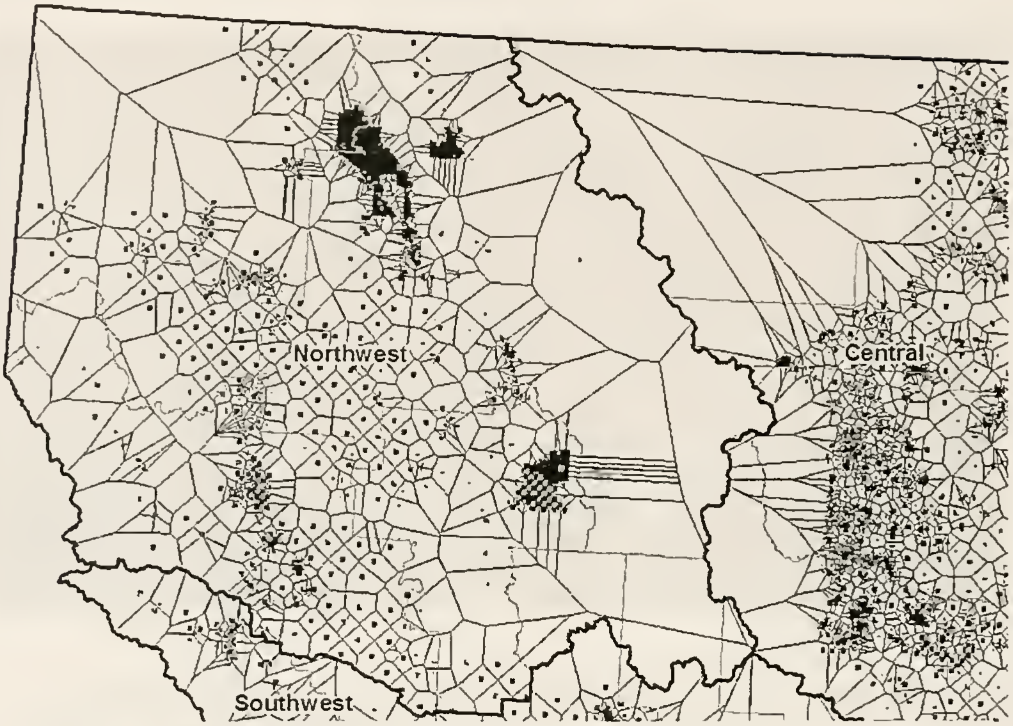
A series of proximity analysis was conducted on multiple data layers from public and commercial sources to contribute to an additive model distinguishing the relative potential for residential and commercial/industrial development for each trust land parcel. These analyses resulted in continuous surfaces to selected features stored as a series of ESRI Grids with 90 meter resolution covering the state of Montana. Zonal statistics were calculated for each distance grid and the resulting mean value posted to the state trust land parcel layer.

Neighborhood analysis for state trust lands

The neighborhood around each state trust land parcel was defined using Thiessen polygons. Thiessen proximal polygons have the unique property that each polygon contains only one input point, and any location within a polygon is closer to its associated point than to the point of any other polygon.

Analysis involving residences used the CAMA property indicator identifying which parcels had a residence or mobile home. The year the residence was built was also derived from the CAMA database to determine those built in the last five and ten year increments. The CAMA data is oriented around property tax purposes, unlike the census which is focused on population. The CAMA data only recorded the presence or absence of a residence and does not indicate the number of residences on a parcel if more than one existed. Commercial entities like apartments were listed in the commercial CAMA data, but the residential counts used in this study undercounted residences on parcels with multiple occurrences.

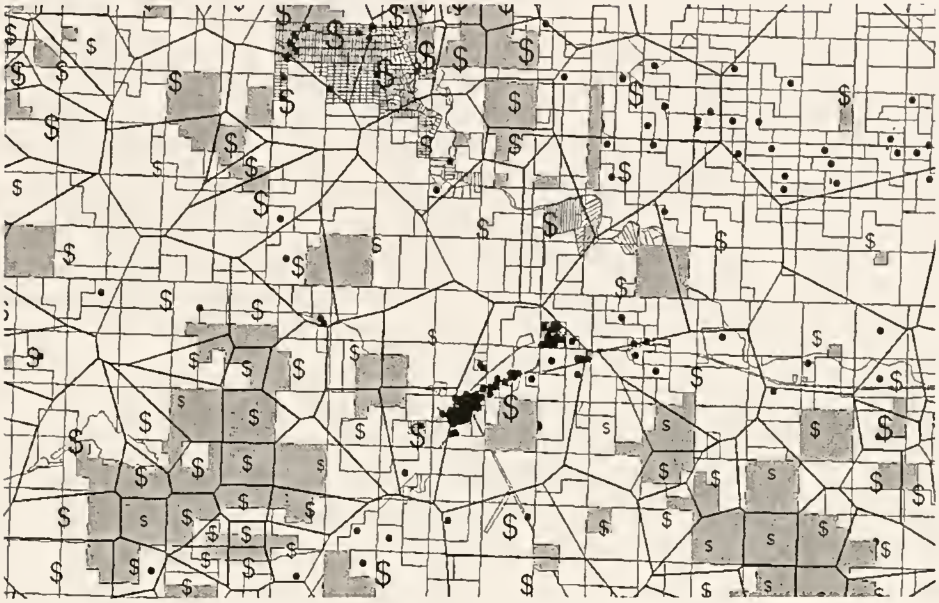
Figure 3 Thiessen polygons defining trust land parcel neighborhoods



Attributes measuring household differences between 1990 and 2003 and projected differences between 2003-2008 were calculated by extracting ESRI Business Analyst data by census block group with the growth rates assigned to each block group. These were converted to ESRI grid layers with 90 meter resolution cells, each assigned the growth rate for that census block group. The mean value of the growth rate grids were then calculated for each Thiessen polygon from these grids. This provided the basis to calculate an average rate of growth or decline in residential housing in the area around state trust land parcels in the recent past and predicted in the near future.

The cadastral parcels were also used as the unit of analysis for measurements provided to Dr Jackson as the basis for regression models on the economic predictions for residential development. In addition to the variables already described, parcels larger than 1 acre were identified and summarized by county and land office.

Figure 4 Regression models for economic predictions based on CAMA economic and growth variables



Subsequently, parcels greater than 1 acre and smaller than 25 acres were identified. The total final land value, total final building value and total cost value of the improvements for each parcel from the CAMA database and total count of parcels with a dwelling and residence from residential parcels were summed by county and land office.

Relative potential for residential development in areas near DNRC trust land parcels

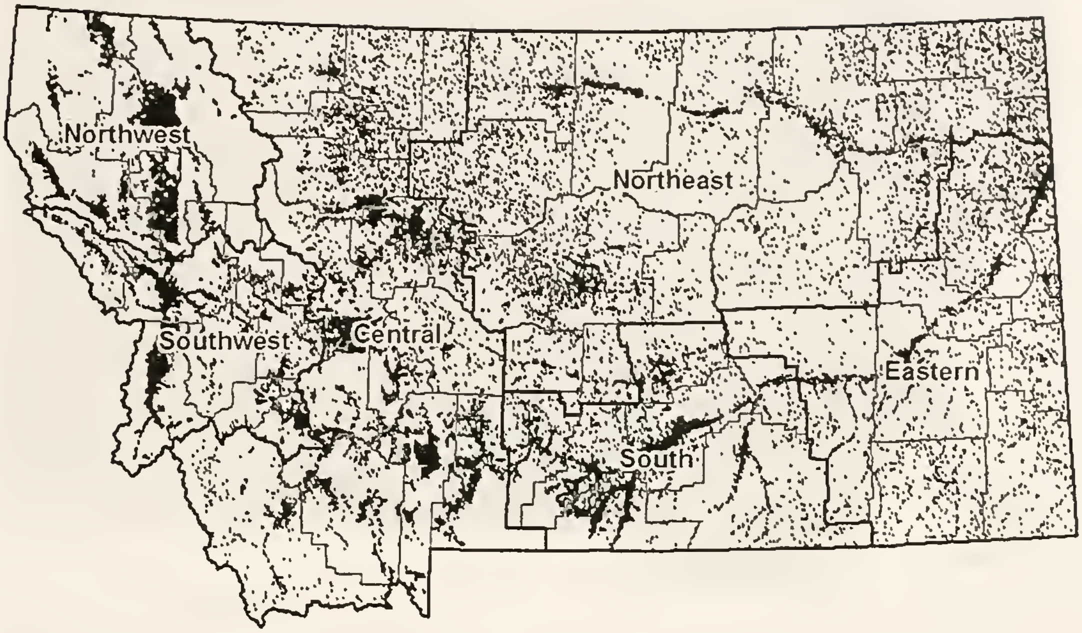
The variables used to summarize the likelihood of residential development were based on previous research and are the variables that are most highly correlated with development in previous studies. Quantile measurements were used to divide each variable into high, medium and low classes. The acreages were then summed for these classes. The simple additive model used to determine the final quantile class values were groupings of these quantile classes. A detailed statistical analysis of the descriptive geostatistical metrics derived in this project was not conducted. Building a suitability index created from a combination of statistical models (logistic regression, regression tree and cluster analysis) could be used to fit an equation to more accurately predict residential development or quantify the relationship of the variables to potential development. This type of analysis could be accomplished using the final data layer we created as part of the more detailed analysis required at the site level. For this analysis, the acreage summaries were tabulated on nominal and ordinal measurement scales, but the underlying data base attached to each state trust land parcel includes continuous variable measurements for future analysis.

The data provided in Table 3 shows the total acres of state trust land with higher potential to be developed in each DNRC land office. The definition of "higher potential" is a relative term. In this instance it is not the result of a statistical model, but is the lands in the highest class of all state trust lands, by each land office, split into four quantiles, grouped into three classes resulting from summing a series of covariate variables commonly agreed to be related to rural residential development. The data do not reflect or infer causation, they were summarized from variables that have been identified in rural residential development research in Montana as highly correlated. In some instances they may be responsible for growth, but in others they could result from the effects of growth. DNRC staff chose to analyze each land office individually, rather than on a statewide basis. For example, features outside of a land office were not measured even if they were closer to a state trust land parcel.

This project examined several studies of rural development and selected common variables from two local studies for this analysis. One was done in the Greater Yellowstone Ecosystem (GYE) (Hernandez, 2004), and the other in the Bitterroot Valley of Western Montana (Christensen, 2002). The primary reason were selected these two studies was the fine scale of geographic granularity of their analysis. The Hernandez study used 1 square mile sections of land and property tax data and the Christensen study used private land parcels and property tax data. Most other analysis of human settlement and growth patterns utilized coarser geographic data as the unit of analysis. These two studies occurred in areas experiencing the fastest growth in Montana and are likely not representative of all areas in the state, particularly the rural agricultural portions of the eastern and central portion. These two studies do reflect the high growth portions of the state which are ranked relatively more likely to experience future rural residential development.

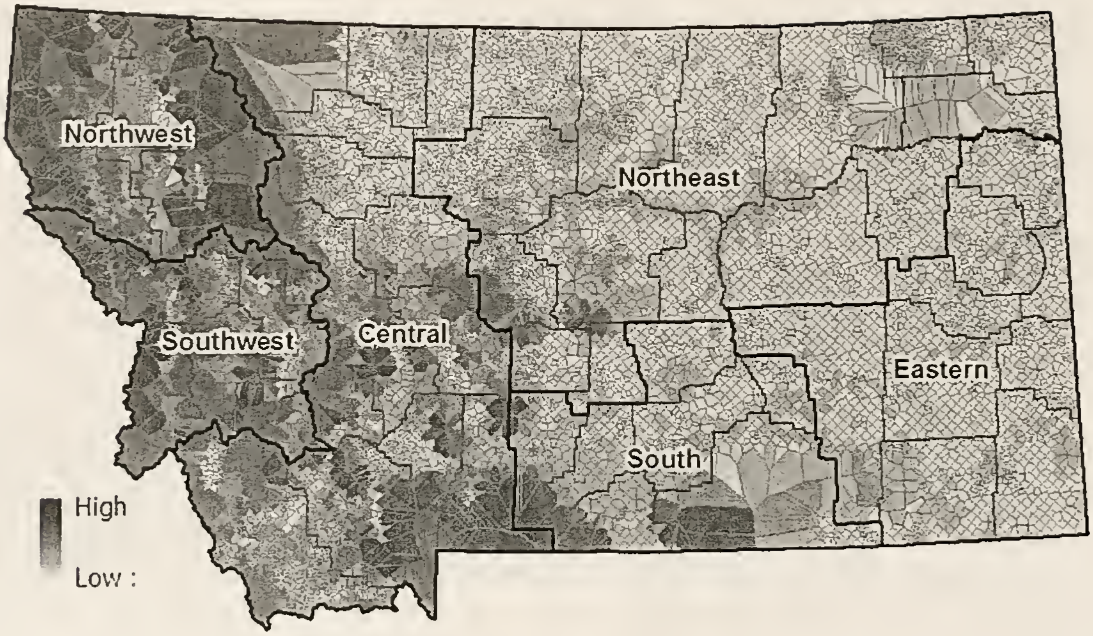
The sign or direction of the correlation was generally similar between the two studies for almost all variables. Only a few attributes had conflicting results. Those that were in conflict regarding the direction (positive or negative) of the relationship were not included in the summary results.

Figure 5 Housing density - each dot represents a parcel with a residence



Among the strongest correlation in both studies was existing density of development and encroachment, showing a positive correlation to future rural residential development. Variance in elevation was a significant variable in the Hernandez study, and in the Christensen study, they measured "viewshed" characteristics, including number of peaks in sight from each parcel. Transportation variables were strongly correlated in both studies, with road density a positive relationship, and a negative relationship for travel distance to town and distance to a state or county road. In the service class of variables in the Hernandez study driving distance to airports and hospitals were the most highly correlated negative relationship, and similar patterns were found in the Bitterroot with distance to schools, service businesses and all businesses .

Figure 6 Elevation variance positively correlated with residential growth



Distance to major steams, rivers and water bodies was negatively correlated with growth in both studies, there was less development farther away from perennial and intermittent water sources.

Figure 7 Services including airports and hospitals were important predictors of residential growth

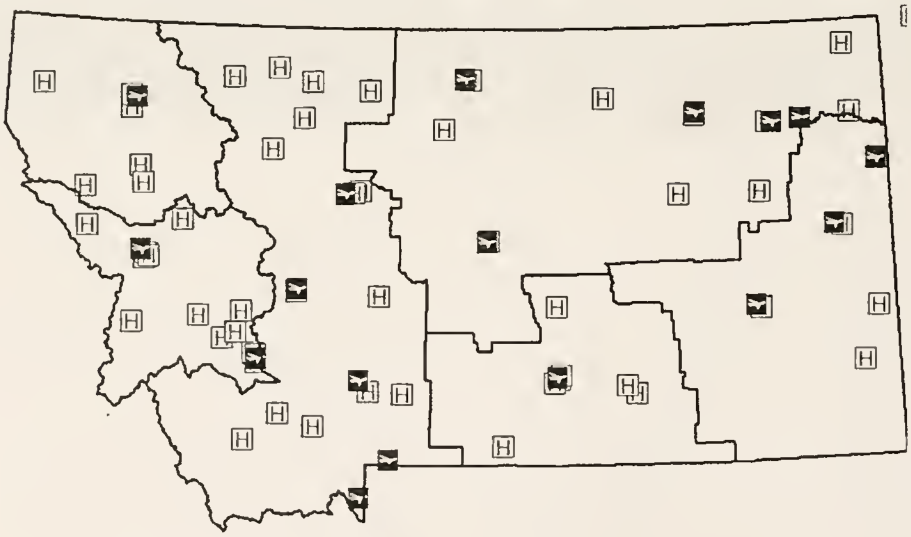


Figure 8 Household growth rates by census block group 1990-2000

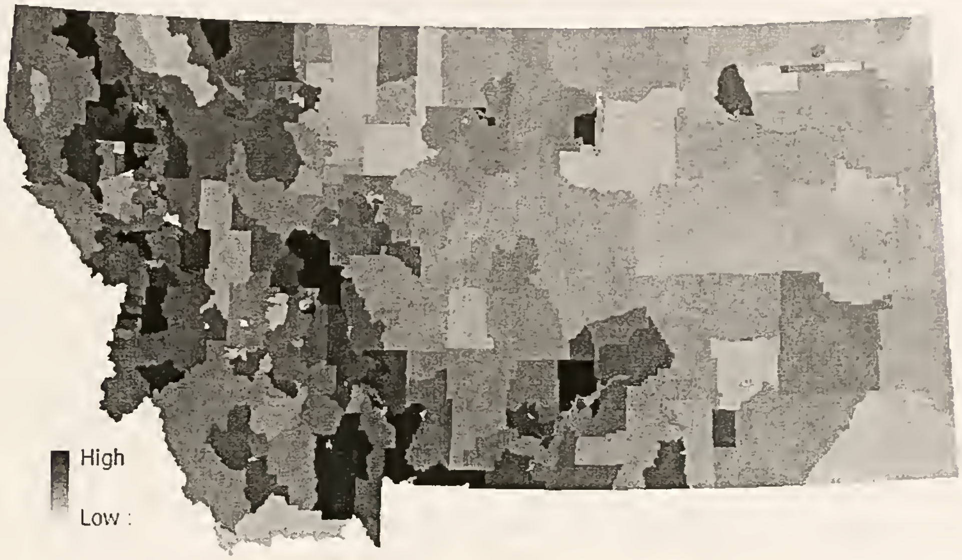


Figure 9 Road density per square mile

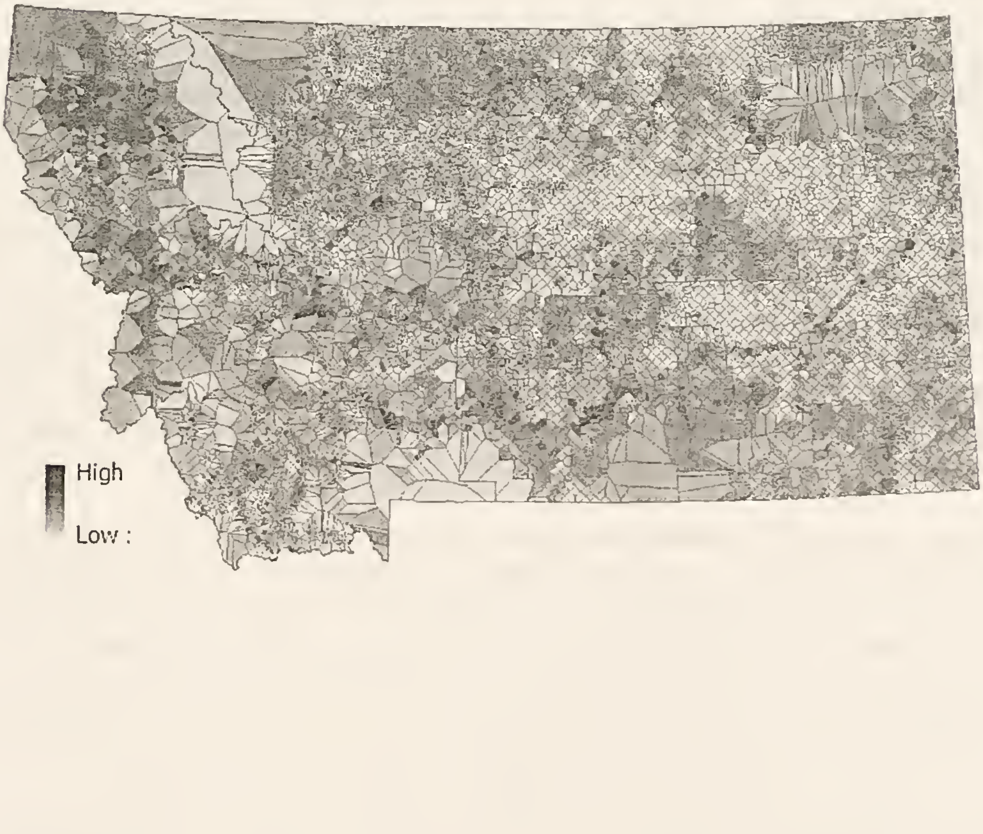
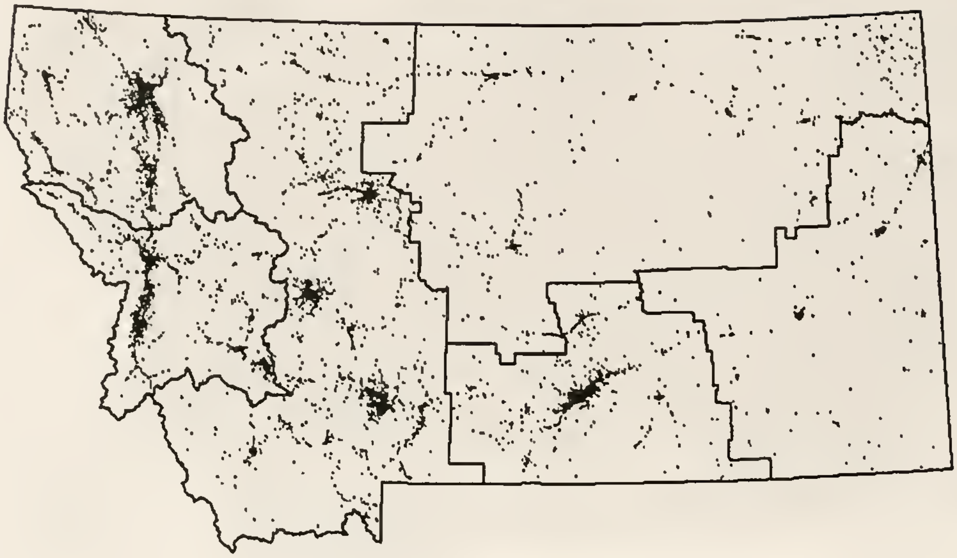


Figure 10 Commercial activity - each point is a Montana business



There were mixed results in the correlation of public lands and conservation easements to growth and development. In the Hernandez study near the GYE there was a strong negative relationship between rural residential growth and distance to National Parks (development decreased as distance from National Parks increased), but the relationship was positive for all public lands and conservation easements (area near towns that were further from public lands and easements tended to experience more growth). The Christensen study showed negative relationships for proximity to all categories of public lands and easements. The Hernandez study provides a possible explanation for their results attributing it to the vast difference in types of public lands. Due to these discrepancies, the proximity measures calculated for trust land parcels in the summed model for trust lands were not used. The Hernandez study examined a few variables that were not measured in the Christensen study, such as educational attainment and agricultural productivity that were strongly related to growth in the GYE area. These were not measured in the examination of state trust land parcels.

Using the two site specific Montana studies, the measurable attributes which best fit the residential growth models were selected. Acreages were calculated for the attributes, listed in Table 2 in italics, individually for the immediate neighborhood around each state trust parcel (defined by Thiessen polygons), or the distance measurement directly to the state trust land parcel, either based on metrics of total counts, average density, or proximity distance measurements, and classified each into three quantiles, by land office. High, medium, and low class values were assigned: High=>75%, Medium=25-75%, Low=<25%. Those variables that were negatively correlated were inverted to standardize the subsequent comparison in an additive model. As a result all variables were assigned a standardized quantile ranking based on the indication of likelihood of development.

Table 2 Attributes Included in the Model – All Were Classed into Quantiles

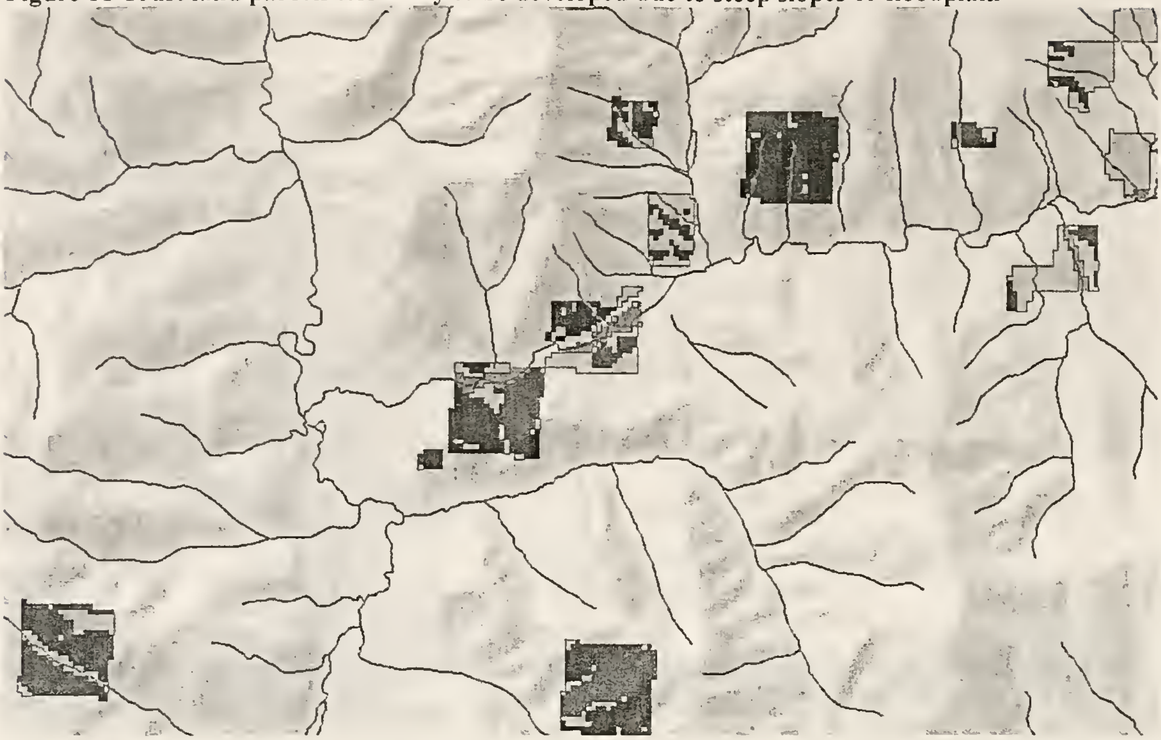
-Q_D_RES	Distance to nearest residence
-Q_D_RES5	Distance to nearest residence in neighborhood built in the last 5 years
-Q_D_PSTRM	Distance to nearest perennial stream
-Q_D_ROADS	Distance to nearest state or county road
-Q_D_BUS	Distance to nearest commercial business (by address)
-Q_D_SHOP	Distance to nearest major shopping center
-Q_D_COMM	Distance to nearest commercial parcel
-Q_D_HOSPITAL	Distance to nearest hospital
-Q_D_USGSAI	Distance to nearest airport serving more than 250 passengers
+Q_CNT_RES	Number of residential parcels in neighborhood
+Q_ROAD_DEN	Average road density in neighborhood
+Q_DH9000	Increase in households in neighborhood between 1990-2000 census
+Q_DH0308	Predicted increase in households in neighborhood between 2003-2008 (ESRIBis estimate)
+Q_ELEVSTD	Standard deviation of elevation in neighborhood

These rankings were then summed across all ordinal scaled variables and the results were again classified into four quantiles, and assigned into three classes using the same percentage classes (High=>75%, Medium=50-75%, Low=<25%) . The upper quantile of the composite highly likely parcels was then cross referenced against the acres potentially developable within that parcel and the resulting acres summed by land office to create the results in Table 3 and depicted in Figure 14.

Developable portions of DNRC parcels

In addition to the potential for residential development, the approximate acreage of trust land parcels likely to be developable was also calculated, subtracting out portions of parcels with physical constraints and classifying them as unlikely to be developed for residential purposes. As a practical rule of thumb, a slope limit and simulated floodplain was used to define these areas. The slope grid was reclassified into slopes more than and less than 25%, the cutoff for septic system regulations in Montana.

Figure 11 Trust land parcels less likely to be developed due to steep slopes or floodplain

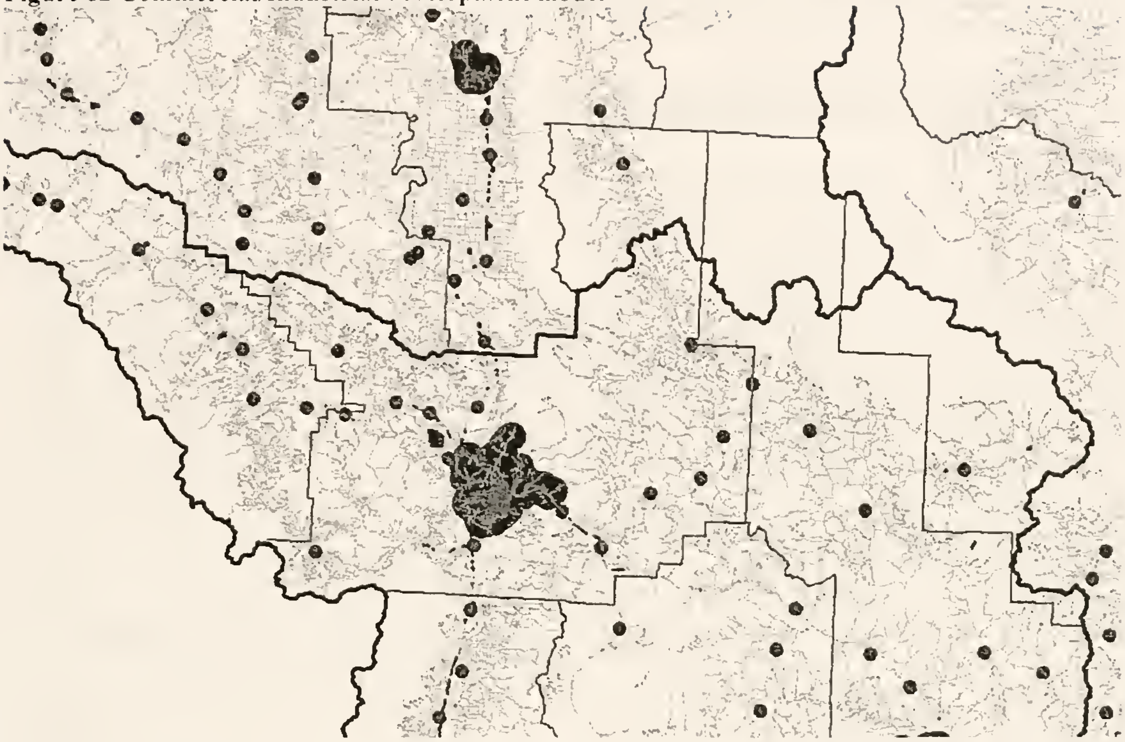


As described in the data section, floodplain was simulated using the perennial streams identified in the National Hydrologic data set mapped at a scale of 1 to 100,000. Buffers of ¼ mile were derived around these streams and modified with an inverse relationship by the slope grid, making the simulated floodplain buffer narrower where slopes were steeper. The union of these two analysis grids was then intersected with the DNRC parcels converted to a grid with the same cell size. The resulting grid, splitting the trust land parcels into two classes, developable and non-developable was then used to calculate acreages in each land office.

Relative potential for commercial and industrial development

No studies similar to the residential model research in the previous section were located for commercial and industrial development potential.

Figure 12 Commercial/Industrial development model

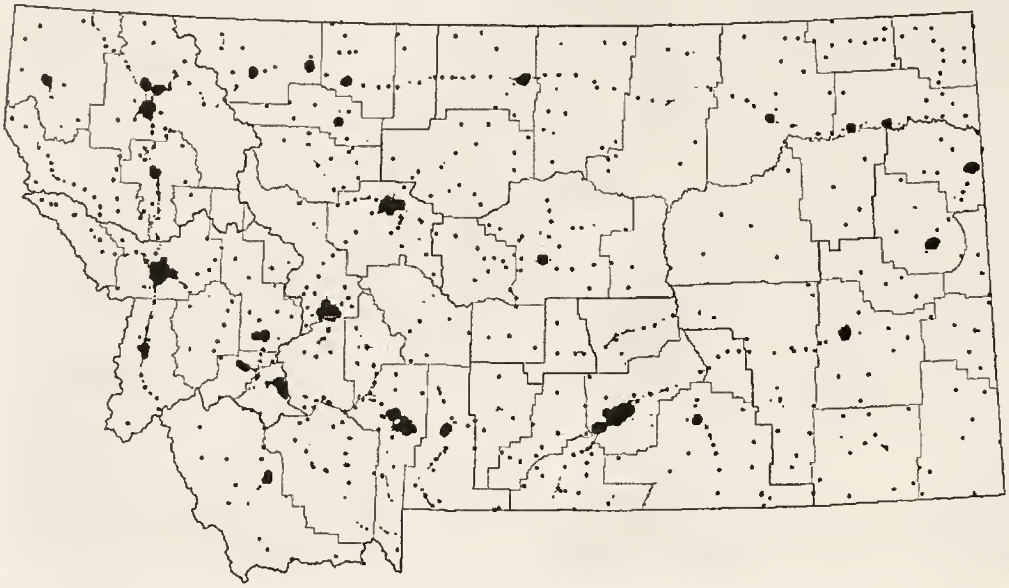


The model included the following components:

1) The Census 2000 layer from NRIS is a polygon layer of major cities in Montana derived from data from the Census Bureau. Some cities also have digital city boundaries and urban area maps, but variability in availability and standards for creation of the digital data precluded use of more detailed local data. A Euclidian distance grid was created based on the distance from the external boundary of the major city polygon layer. This was subsequently resampled to two classes, those within or outside a 2 mile buffer of a major town.
2) An identical analysis was run on areas within and outside a 1 mile buffer of the 624 largest towns in Montana (from NRIS "Montana towns" GIS layer).
3) Separate proximity distance grids were created for the areas within 1/4 mile of a major highway and within 1/4 mile of an existing commercial or industrial parcel from property tax database
4) The resulting four grids were summed, and all intersecting areas were kept in the model. The results were overlaid with developable lands, slopes greater and less than 25% and outside of simulated floodplain (the same map layer as the residential model was used) to determine developable portions of commercial and industrial parcels. The resulting statewide grid was overlaid on the land offices and the acreages of commercial/industrial lands were calculated for each land office. We also overlaid the results with all trust parcels and selected the subset of trust parcels that included at least 2 acres of commercial or industrial land in the model.

When the analysis was complete, final commercial/industrial grid was overlaid with the developable residential land to derive an overlap map. The acreage totals of this analysis were subtotalled by land office.

Figure 13 Commercial model - all areas in Montana



DNRC land office summarization

The analysis described in the previous sections was conducted on finer grained scaled data layers. The final step in the analysis was to summarize the data to the DNRC land office level suitable for the analysis in the programmatic GIS. The source data will have utility beyond the current analysis for subsequent site analysis in areas smaller than the land office administrative boundaries.

The parcel data was tabulated for each land office and summarized.

- Categorize values for each variable into three standard deviations and assign class values
- Summarize acreage of state trust land more and less likely to be developed for residential uses
- Summarize acreage of state trust lands more likely to be developed for commercial and industrial uses
- Acreage summarization within DNRC land office regions
- Prepare spreadsheet of data metrics for each state trust land parcel

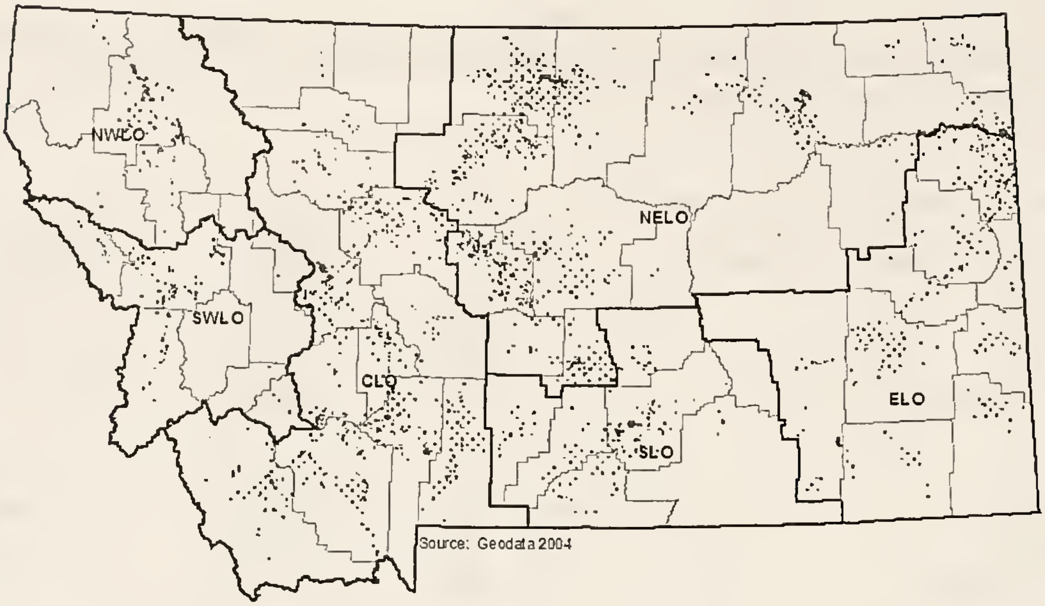
Analysis Results

The results of the GIS analysis are included below. Figure 14 through Figure 16 State trust land parcels in lower quantile of residential development show the geographic distribution of each of the quantile categories.

Table 3 All Developable acres by land office

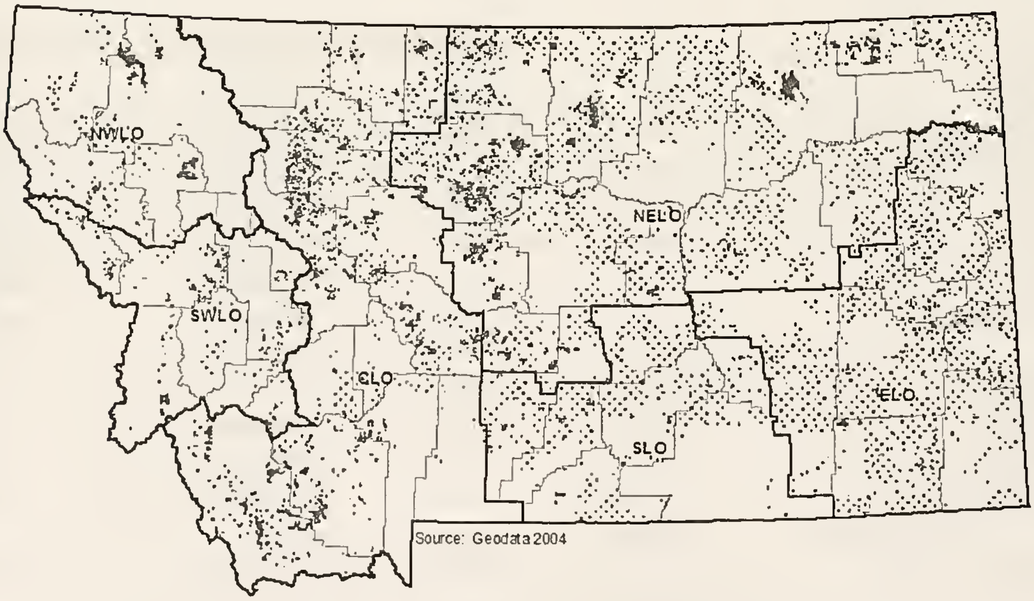
AREA OFFICE	QUANTILE	COUNT	TOTAL ACRES	DEVELOPABLE ACRES
CLO	3	680	228,261	167,773
CLO	2	2,059	629,700	506,089
CLO	1	1,242	403,704	327,880
CLO Subtotal		**3,981**	**1,261,665**	**1,001,742**
ELO	3	326	128,015	114,261
ELO	2	1,154	577,769	534,260
ELO	1	518	274,029	261,357
ELO Subtotal		**1,998**	**979,813**	**909,878**
NELO	3	997	317,478	284,097
NELO	2	2,877	1,079,331	995,784
NELO	1	1,601	617,661	573,225
NELO Subtotal		**5,475**	**2,014,470**	**1,853,106**
NWLO	3	139	42,158	28,268
NWLO	2	387	162,670	82,074
NWLO	1	256	111,357	42,516
NWLO Subtotal		**782**	**316,184**	**152,858**
SLO	3	157	62,799	53,959
SLO	2	435	218,197	195,160
SLO	1	253	111,969	105,726
SLO Subtotal		**845**	**392,965**	**354,845**
SWLO	3	121	37,199	19,027
SWLO	2	321	124,046	72,017
SWLO	1	170	75,259	51,333
SWLO Subtotal		**612**	**236,504**	**142,377**
TOTAL		**13,693**	**5,201,601**	**4,414,806**

Figure 14 State trust land parcels in upper quantile of residential development



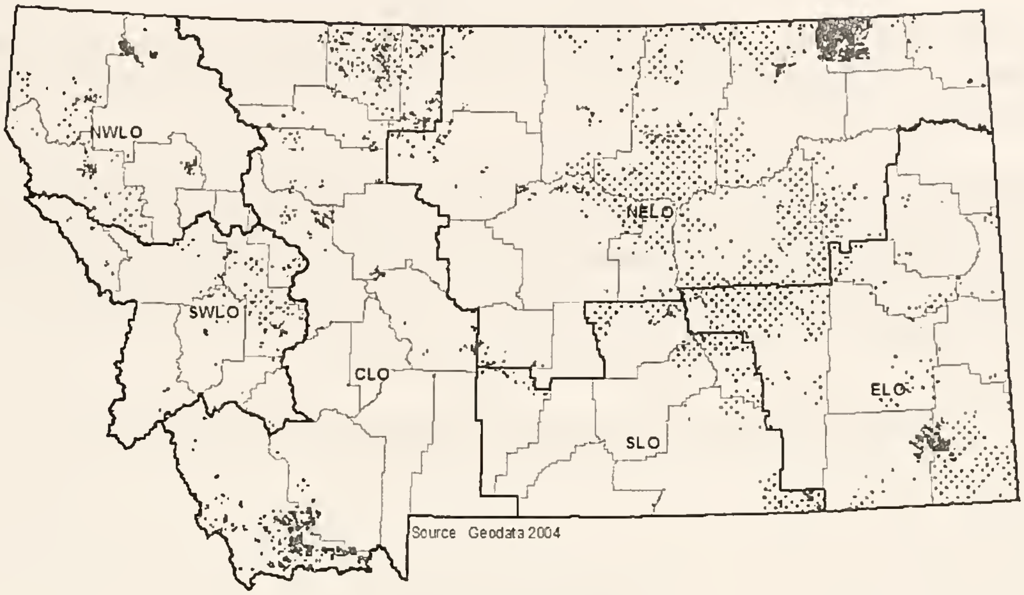
Source: Geodata 2004

Figure 15 State trust land parcels in middle quantile of residential development



Source: Geodata 2004

Figure 16 State trust land parcels in lower quantile of residential development



Source Geodata 2004

Table 4 shows all commercial/industrial potential land acreages by land office in two categories (developable and non-developable). Table 5 shows the portion of the commercial/industrial potential land acreages that fall within DNRC developable parcels, also by land office.

Table 4 Acreage of all commercial and industrial parcels developable and not developable

All Commercial & Industrial	Acres
SWLO Develop	307,622
SWLO Non develop	69,292
SLO Develop	292,668
SLO Non Develop	8,526
NWLO Develop	270,582
NWLO Non Develop	29,572
ELO Develop	244,220
ELO Non Develop	1,424
CLO Develop	663,688
CLO Non Develop	45,370
NELO Develop	395,630
NELO Non-Develop	4,572

Table 5 Developable acreage of commercial and industrial trust land parcels

DNRC Developable Commercial & Industrial	Acres
SWLO Develop	6,052
SLO Develop	9,104
NWLO Develop	6,940
ELO Develop	9,336
CLO Develop	16,330
NELO Develop	17,220

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Hernandez, P.A, and advisors Hansen, A.J., Rasker, R., Maxwell, B (2004) "Rates and Drivers of Rural Residential Development in the Greater Yellowstone", Masters Thesis, Montana State University

Christensen, N. A., Landres, P. B. (2002). "Modeling residential development behavior in the urban/forest interface with the Bitterroot National Forest in Montana." Book of Abstracts, 9th International Symposium on Society and Resource Management: Choices and Consequences – Natural Resources and Societal Decision-Making, June 2 –5, Indiana University, Bloomington.

Appendix D

Economic Analysis Appendix

Land Use Forecasts, Financial Returns and Economic Impacts

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Revised April 23, 2004

Introduction

This Appendix presents both the methods and results of the economic analysis. It includes forecasts of land use, and the expected value of land , investment analyses, and how EIS alternatives will impact returns to the school trusts as well as larger impacts on the Montana economy. The basic idea behind the forecasts is that land allocation is a function of income and population. In other words, the demand for land depends upon the population and income in an area. Land allocation is defined in terms of land uses and the three key uses being analyzed are industrial, commercial and residential uses. The residential uses examined are parcels between 1 and 25 acres in size. In the most general terms the amount of land allocated to each of these uses is seen as being a function of the population and income in the particular geographical area. However, there is some minor variation in this general approach to modeling. The analysis of these uses is broken into two subcomponents. First a model is developed that predicts the variation in the land use in each of Montana's fifty-six counties. The second part of the exercise involves coupling the predictive models with forecasts of income and population for the six state land office areas to forecast the change in land uses for the period through the year 2025.

Predicting and Forecasting Commercial and Industrial Land Uses and Values

The basic forecasts rely on combining the commercial and industrial land bases into one variable, the total commercial and industrial land in each county. After analyzing and forecasting this land category, changes in the ratio of commercial to industrial lands for each land office are discussed. Commercial and industrial uses are categories that are commonly used in land use planning and taxation in Montana. At times, it is hard to actually distinguish these uses from residential uses. For example, multifamily dwellings are taxed as commercial land uses in Montana.

The estimates of commercial and industrial land relied upon data provided by the Montana Department of Revenue property tax database for the year 2002. This data was summarized into acreage totals for each county. Model 1 below predicts the number of commercial/industrial acres in each county as a function of county income, (the product of percapita personal income times county population), a "dummy (0,1) variable" (SMALLCTY) which has the value of 1 for counties with populations less than 2500 people and two interactive variables (CLOICINC and SWLICINC). One of these variables takes the value of county income for counties in the Central Land Office (CLOINC) and otherwise has the value of zero. Likewise the SWLICINC variable is the county income for each county in the Southwest Land Office and is zero for the other counties. The results of the model are summarized in Table 1.

Table 1
Predicting the Combined Commercial and Industrial Land Base
In Montana Counties

Dependent variable is BUSINAC   Mean = 2726.75350, S.D. = 3374.6318
Model size: Observations = 56, Parameters = 5, Deg.Fr. = 51
Residuals: Sum of squares= 0.174058E+09 Std.Dev. = 1847.40470
Fit: R-squared = 0.72211, Adjusted R-squared = 0.70031
Model test: F[4, 51] = 33.13, Prob value = 0.00000
Results Corrected for heteroskedasticity
Breusch - Pagan chi-squared = 7.4591, with 4 degrees of freedom

Variable	Coefficient	Standard Error	t-ratio	p-value	Mean of X
Constant	1437.6	324.43	4.431	0.00005	
CLOICINC	-0.98555E-06	0.50651E-06	-1.946	0.05720	0.1197E+09
SWLICINC	0.10898E-05	0.32764E-06	3.326	0.00164	0.7651E+08
SMALLCTY	-1428.1	322.43	-4.429	0.00005	0.1250
CTYINCOM	0.40615E-05	0.19295E-06	21.049	0.00000	0.3699E+09

Based upon the calculated F statistic, the overall equation is significant. The adjusted R-square indicates that the model explains about 70 % of the variation in the number of acres of commercial and industrial land in each county. The industrial/commercial land base in each county is extremely variable. The range in industrial/commercial acres is 28 acres to 15,800 acres and the mean is 2726.7 acres per county. Each of the variables included in the model are statistically significant based upon two-tailed t-tests at an alpha level of .1. Since the forecasts of future land use are based on forecasts of population and percapita income in each county, the above equation is most useful in this regard. The forecasts developed by Polsin are for population and income at the land office level. Thus each county's income and population can be grown at the rate of the land office in which it is contained so that future levels of land use in each respective land office can be estimated.

The interactive variables indicate that, other things equal, there is less commercial/industrial land in central land office counties than other counties and more commercial/industrial land in southwestern land office counties than other counties. Again, however, counties within either Southwestern or Central Land office with high county personal income have greater commercial/industrial lands than those with lower county personal income.

The equation that predicts the value of combined commercial and industrial land in each county is found in table 2. The land value is again the assessed market land value for commercial and industrial lands and comes from the Department of Revenue 2003 property tax assessment.

Table 2
Predicting the Value of Commercial/Industrial Land Value per Acre
in Montana Counties

Dependent variable is COMICVAC Mean = 6014.75589, S.D. = 7612.2731
Model size: Observations = 56, Parameters = 5, Deg.Fr. = 51
Residuals: Sum of squares= 0.324219E+09 Std.Dev. = 2521.35714
Fit: R-squared = 0.89827, Adjusted R-squared = 0.89029
Model test: F[4, 51] = 112.58, Prob value = 0.00000
Results Corrected for heteroskedasticity
Breusch - Pagan chi-squared = 9.2440, with 4 degrees of freedom

Variable	Coefficient	Standard Error	t-ratio	p-value	Mean of X
PCAPY01	0.95906E-01	0.18106E-01	5.297	0.00000	0.2137E+05
CLOICINC	0.71971E-05	0.13642E-05	5.276	0.00000	0.1197E+09
NWLICINC	0.91733E-05	0.44337E-06	20.690	0.00000	0.4938E+08
SWLICINC	0.24281E-05	0.41572E-06	5.841	0.00000	0.7651E+08
POP2002	0.15471	0.59898E-02	25.829	0.00000	0.1624E+05

The model in Table two is again significant based on the calculated F-statistic. While there is high variation in the value per acre of combined commercial and industrial lands in each county (a range of $178/acre to $30154/acre) the model summarized in Table 2 explains 89 percent of this total variation. The explanatory variables again are significant at an alpha level of .1. They are essentially based on both income and population. PCAPY01 is the percapita income in each county in the year 2001.

POOP2002 is the county population in the year 2002. CLOICINC is the county income for each county in the Central Land Office. It has a value of zero for counties not in this land office. NWLICINC and SWLICINC respectively are calculated in the same way for counties in the Northwest and Southwest land offices. (County income is the product of population and percapita income). The coefficients for these variables indicate that other things equal, counties in these land offices have higher land values for commercial and industrial lands than for counties in other land offices. Forecasts at the land office level for future industrial/commercial land prices are based on forecasts of population and income developed by Polsin (2003).

The forecasts of industrial/commercial acreages and commercial/industrial land values were made in a spreadsheet. These are the steps involved in developing the forecasts. First, the Polsin forecasts of population, percapita personal income and county personal income were converted to compound rates of change for the forecasting period. Next these compound rates of change were used to forecast, population, percapita income and county income in each county. Next the acreage for each county was forecast into the future. These forecasts were then summed into a land office total. Compound rates of change were then calculated for each land office and applied to the actual base acreage and land office weighted land prices. These steps were done since the population itself was a cross section of counties and the forecasts and analysis were made at the land office level. Table 3 below contains the combined Commercial/Industrial land base forecasts for each land office.

Table 3
Forecasts for Total Commercial/Industrial Acres by DNRC Land Office

		Mid-Range	Forecast	Rural	Residence	
			1 to 26 Acres			
Land Off	Actual2003	2005	2010	2015	2020	2025
Clo	133970.6	135430	143754.4	151188.6	158820.4	166809.5
elo	11404.9	11346.62	11278.67	11275.88	11287.67	11360.55
nelo	19951.75	19879.04	19953.52	20083.09	20283.31	20519.63
nwlo	131900.8	133318.5	140876.2	147589.8	154287.7	161536.6
slo	52553.42	53182.99	56357.77	59280.7	62235.75	65405.95
swlo	104786.2	106289.8	115242.2	122679.6	130121.7	137646.3
	454567.7	459446.9	487462.7	512097.7	537036.6	563278.6

It is clear from the forecasts that there will be a substantial increase in the land associated with commercial and industrial land uses. There is considerably more commercial land use than industrial. In fact for every acre taxed as "industrial" in 2002, there was about 5.7 acres taxed as commercial. Keeping in mind that multifamily apartments and mixed commercial offices and residential buildings are included in the commercial land base, these uses are expected to grow in the future. It should also be apparent that from the origins of commercial and industrial land uses in Montana, commercial uses have grown relative to industrial uses. While the commercial and industrial lands are lumped together for purposes of forecasting, it may be useful to recognize that the commercial land uses are expected to grow relative to the industrial uses throughout the planning horizon.

The forecasts for Commercial/Industrial Land Value are presented in Table 4 below.

Table 4
Commercial and Industrial Land Value
By DNRC Land Office
Expressed in Constant 2003 Dollars Per Acre

Land Off	$/ac 2003	$/ac2010	$/ac2015	$/ac2020	$/ac2025
clo	11674.81	13806.92	15332.96	17027.68	18909.71
elo	3911.467	4148.421	4303.753	4464.9	4632.082
nelo	2469.745	2583.756	2657.67	2733.698	2811.902
nwlo	19160.28	23613.86	26908.86	30663.63	34942.33
slo	13883.9	15563.6	16715.1	17951.81	19280.01
swlo	10401.86	12095.28	13290.97	14604.85	16048.62

The values come from the Department of Revenue assessed market values of commercial and industrial lands in each county. The land office averages were first developed on a county basis using steps similar to those discussed for the spreadsheet calculations of acre forecasts previously in this section. These prices were then weighted by the respective forecast acres in each county to derive averages for each land office. While these values are "bare land" values. They do represent the values of developed commercial and industrial sites. In order to get "raw land" commercial and industrial values used in the financial analyses, the above forecast prices will be multiplied by a factor of 1/3.

Forecasting Land Use and the Value of Rural Residential Lands

Residential land uses in Montana occupy a vast range of landscapes and ownership sizes. Each farm or ranch typically has one or more home sites. At the other end of the spectrum are city and town lots with single-family residences. After considerable discussion with DNRC staff and based on their understanding of the spatial configuration of state trust lands, it was decided to focus the analysis on what is typically referred to as "rural residences". From the standpoint of the Department of Revenue CAMA database, rural residences were defined for this analysis as private parcels with a single-family residence that were greater than one acre but less than or equal to 25 acres in size. The forecasts of growth in this particular land use and expected increases in value were limited to this segment of the land base because of the nature of the distribution of trust land parcels and their potential to be developed for this kind of land use.

Table 5 includes the statistical model that was developed to forecast the future land base devoted to rural residences. The calculate F-statistic reported in Table 5

Table 5
Predicting the Rural Residential Land Base
Properties 1 to 25 acres in size

Dependent variable is RRAC125 Mean = 7559.71347, S.D. = 11794.3848
Model size: Observations = 56, Parameters = 6, Deg.Fr. = 50
Residuals: Sum of squares= 0.212120E+10 Std.Dev. = 6513.36614
Fit: R-squared = 0.72275, Adjusted R-squared = 0.69503
Model test: F[5, 50] = 26.07, Prob value = 0.00000
Results Corrected for heteroskedasticity
Breusch - Pagan chi-squared = 69.2452, with 5 degrees of freedom

Variable	Coefficient	Standard Error	t-ratio	P-value	Mean of X
CLOPOP	0.37625	0.68420E-01	5.499	0.00000	5059.
ELOPOP	0.24959	0.33362E-01	7.481	0.00000	834.2
NELOPOP	0.22350	0.45057E-01	4.960	0.00001	1477.
NWLOPOP	0.66773	0.54733E-01	12.200	0.00000	2378.
SLOPOP	0.19236	0.10322E-01	18.636	0.00000	3061.
SWLOPOP	0.46447	0.13186	3.522	0.00092	3431.

indicates the equation is significant and the R-squared adjusted for degrees of freedom indicates that the seven independent variables explain about 73% of the variation in rural residential land base in the 56 counties. Acreage for rural residences from 1 through 25 acres is highly variable. The average number of acres per county in the 2003 Department of Revenue appraisal was 7,559.71/county among the 56 counties. One county had only 102.64 acres of rural residences while the county with the highest number of rural residences had 51,493.9 acres in rural residences.

The independent variables that explain the variation among the counties essentially combine county population with dummy variables for the various land offices. For example, CLOPOP is the result of multiplying the 0,1 dummy variable for the Central Land office counties times the population in the counties. The ELO and NELO are simply 0,1 variables for counties in the Eastern and Northeastern Land Offices respectively. Each independent variable is significant at an alpha test level of 0.1. Forecasts of population are used to forecast future acreages.[1]

Table 6 contains consists of a summary of the model that predicts land value per acre in rural residences.

Table 6

Predicting the Value of Rural Residential Land In Montana Counties
Value per Acre Residences (> 1 acre and <= 25 acres)

Dependent variable is RRESVPAC. Mean = 2734.61824, S.D. = 3070.9411
Model size: Observations = 56, Parameters = 7, Deg.Fr. = 49
Residuals: Sum of squares= 0.188014E+09 Std.Dev. = 1958.83324
Fit: R-squared = 0.63752, Adjusted R-squared = 0.59313
Model test: F[7, 48] = 14.36, Prob value = 0.00000
Results Corrected for heteroskedasticity
Breusch - Pagan chi-squared = 57.5047, with 6 degrees of freedom

Variable	Coefficient	Standard Error	t-ratio	P-value	Mean of X
CLO	2319.8	525.70	4.413	0.00006	-.25
ELO	497.93	122.89	4.052	0.00018	0.1607
NELO	489.07	128.23	3.814	0.0038	0.2679

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[1] Income was not a significant predictor of residential uses and was dropped from the equations

NWLO	6076.1	2312.1	2.628	.01144	0.7143E-01
SWLO	1572.3	751.68	2.092	.04167	0.125
SLO	4047.9	792.76	5.106	0.00001	0.125
POP2002	0.49697E-01	0.15316E-01	3.245	0.00212	0.1624E+05

Land value per acre again came from the 2003 Department of Revenue property tax appraisals and the value per county is highly variable with a range of $161.10/acre to $14,769.61/acre. The model is significant (based on a calculated F of 24.36) and the independent variables explain 59.3% of the total variation. The population variable (POP2002) shifts land value for each county and the dummy variables for counties in each land office shifts the value of the counties in each respective land office. All of the independent variables are significant at the alpha level of .10. Forecasts of land rural residential land value rely on forecasts of population and utilize the coefficients for population and land office found in the above equation.

Table 7 contains the forecasts of future acreages in the rural residential land uses.

Table 7
Future Rural Residential Land Use
Parcels 1 through 25 acres in Size
By DNRC Land Office

	Rural	Residential	1 to 26 Ac		
		forecast	total	rural1-25	midrange
landoff	rrac03	rrac10	rrac15	rrac20	rrac25
clo	133015.6	136667.8	143724.8	151150.9	158907.8
elo	12359.92	12189.87	12230.36	12327.93	12392.38
nelo	19951.75	19771.67	19833.14	19922.2	20049.72
nwlo	100677.2	115045.6	124401	133974.9	143939.5
slo	52553.42	56912.93	59842.22	62893.74	66100.08
swlo	104786.2	116219.4	124110	132271.9	140731.2
total	423344	456807.2	484141.6	512541.5	542120.6

It is clear from Table 7 that rural residential land uses involve a far greater land base than combined rural/industrial land uses reported in Table 3. It is also apparent that the land offices which have the highest rates of population growth are forecast to have the highest rate of rural residential land use growth.

Table 8 below contains the forecasts of land prices for rural residential lands in the six state land offices. These land values result from applying the population forecasts to the land price model reported in Table 6 and then weighting the expected future prices by the expected acreages in the various counties to come up with weighed average expected future prices by land offices.

Table 8
Expected Future Prices of
Rural Residential Lands in DNRC Land Offices (2003 prices)

		Future	Prices		
	Rural	Residences 1 to 26 Ac		$/Acre	
	2003	2010	2015	2020	2025
CLO	5006.88	5223.22	5373.237	5529.935	5693.934
ELO	914.3079	905.7535	903.7046	902.5932	902.2351
NELO	937.5223	933.4748	934.8563	936.8581	939.7245
NWLO	8742.646	9123.208	9370.997	9624.572	9888.496
SLO	6700.29	7125.676	7411.507	7709.263	8022.128
SWLO	7236.395	7584.29	7824.393	8072.745	8330.15

The land offices that have the highest rates of increase in population growth are forecast to experience the highest rates of growth in residential land prices. The Eastern Land Office is forecast to experience a slight drop in the real price of rural residential land and the Northeast Land Office is forecast to experience a very modest price increase. The Southern Land Office, Southwest Land Office and Northwest Land Offices are expected to experience the largest rates of increase in rural residential land prices over the planning horizon. It is also clear that the typical industrial/commercial parcel (Table 4) is worth considerably more than the typical rural residential parcel (Table 8).

Growth in Land Use

Tables 3 and 7 above show the total expected future land use for combined commercial/industrial and rural residential land uses for the midrange forecast. The following table (Table 9) shows the growth in land uses over the planning horizon. The mid-range growth forecasts are "periodic". That means that each entry in the table show how much the land base is expected to change in the particular growth period. Only the mid-range growth forecasts are shown in the table. The analysis includes both a high bound and low bound forecasts which are based on these tables but include a plus/minus 25% range around the mid-range forecasts.

Table 9
Mid-Range, Periodic Growth in Rural Residential
And Commercial/Industrial Land Uses

		All owner	Rural Resid	1 thru 25 Acres	
	Periodic	Growth		Midrange	
Land off	2003-2010	2011-2015	2016-2020	2021-2025	Total
Clo	3652.26	7056.973	7426.109	7756.869	25892.21
Elo	-170.045	40.49225	97.56398	64.45461	32.466
Nelo	-180.074	61.46374	89.0597	127.5268	97.97592
Nwlo	14368.39	9355.426	9573.896	9964.606	43262.32
Slo	4359.506	2929.295	3051.514	3206.345	13546.66
Swlo	11433.17	7890.694	8161.822	8459.31	35945
Total	33463.21	27334.34	28399.96	29579.11	118776.6

			All owners		
		Periodic	Growth		
		Commercial/	Industrial	(Mid-range)	
Land Off	2002-2010	2011-2015	2016-2020	2021-2025	Total
CLO	5044.5734	3172.3282	3579.714602	3969.178073	15765.79429
ELO	425.72768	175.71355	206.3318014	225.7500579	1033.523083
ELO	425.72768	175.71355	206.3318014	225.7500579	1033.523083
NELO	1036.3267	820.19902	890.82413	981.4201587	3728.770046
NWLO	3387.3173	2236.9846	2471.57472	2734.005999	10829.88267
SLO	3474.618	2299.9123	2579.665189	2877.551653	11231.74714
SWLO	4209.3636	2786.2536	3125.163289	3486.041067	13606.82153
TOTAL	17577.927	11491.391	12853.27373	14273.94701	56196.53875

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Defining the DNRC Alternatives in terms of Land Base and Land Use Change.

EIS alternatives are based on the current role of DNRC ownership in the current land uses. At the present time, the DNRC has the following proportions of developable land in each of the land offices.

Central Land Office	8%
Eastern Land Office	8%
Northeastern Land Office	9%
Northwestern Land Office	10%
Southern Land Office	4%
Southwestern Land Office	7%

These percentages are fundamental to the definition of three of the EIS alternatives.

Alternative B is to develop trust land in proportion to the relative share of the ownership of developable land in each land office. Thus for example, DNRC would take 8% of the growth in residential/industrial and rural residential growth in the Central Land Office. Alternative C which is a more aggressive growth policy is one where the DNRC would double its proportionate share of growth and alternative C is one where the state would grow at half of its proportionate share. Thus, again using the Central Land Office as an example, the Central Land office would take 4% of the growth under Alternative A and 12% of the growth under alternative C. These are summarized in Table 12.

Table 12
EIS Alternatives and DNRC Growth Shares

Land Office	Alt A ½ Proportionate Share (Modest)	Alt B Proportionate Share	Alt C Double Proportionate Share (Aggressive)
Central Land Office	4%	8%	16%
Eastern Land Office	4%	8%	16%
Northeastern Land Office	4.5%	9%	18%
Northwestern Land Office	5%	10%	20%
Southern Land Office	2%	4%	8%
Southwestern Land Office	3.5%	7%	14%

Rates of Return on EIS Alternatives

The rates of return were calculated in a manner consistent with other rates of return calculations used by the Montana DNRC. They are rates of return on equity. In essence these calculations examine net income as a percentage of the capital value of assets rather than simply as the interest rate that equates the present value of a stream of benefits with a stream of costs. The formal calculation of the return on asset value is the net annual income divided by the asset value. This is a very tedious calculation for a number of reasons. First, when conservation easements are sold, the proceeds are deposited into the school trust fund. This in turn is invested and yields annual earnings (95% of the earnings then are used to aid in school or other trust beneficiaries). However, only 5% of lease income is deposited in the trust fund, the rest is made available to provide support for the schools or other trust beneficiaries. Of course, interest earnings reflect a premium for inflation.

After discussions with Paul Engelman, DNRC economist, the calculations for rates of return were done as follows. Equity is estimated by calculating the market value of the land developed over the planning horizon. Since this value reflects price changes as well as changes in yearly quantities, it was calculated by averaging the values in the first and second half of the planning horizon. Gross income is estimated by calculating the total gross income from the mix of leases and land sales over the planning period and then converting it to an average annual amount. The costs needed to convert gross annual income to net income are more problematic from the standpoint of rate of return calculations. This is the structure of annual costs developed by DNRC staff for the three alternatives.

Table 13
Cost Data

EIS Alternative	Current Budget	Additional Budget per Alternative
Alternative A	$1,089,558	$0.
Alternative B.1	$1,089,558	$193,960.
Alternative B.2	$1,089,558	$693,960.
Alternative C.1	$1,089,558	$255,160.
Alternative C.2	$1,089,558	$1,255,160.

Alternative A presents a unique problem in calculating rates of return. The income generated in Alternative A is positive while the extra costs of producing the income are 0. This arises because the DNRC will use its existing budget and staff to continue to develop land leases and sales as well as to service existing leases and operations. As a result, cost apportionment techniques are used that allocate the current budget between new income producing activities associated with EIS Alternative A and existing income producing activities. After calculating rates of return on equity based on this initial apportionment formula, an analysis is employed to see the extent that the ranking of alternatives is dependent on the apportionment method.

The initial approach to cost apportionment is use the estimated average income generated under Alternative A as a percentage of current income from real estate special use operations. The figure is 37%. Thus 37% of the current budget is used as a starting point for calculating the cost of Alternative A. This figure ($403,136) was added to the Additional budget items in the third column above to estimate a total cost of each EIS alternative.

In calculating rates of return, you should notice that there are alternatives noted as B.1 and B.2 as well as C.1 and C.2. The difference lies in the role the DNRC could play in actual development. These differences are noted as "with" or "without" up-front development costs. Currently the state has no money to do the permitting, and infrastructure (streets, utilities) development to create a developed lot. They sell or lease "raw" land. The alternatives with "up-front" development costs both have higher annual budgets and uniquely different income streams. The land leased or sold that is developed has a higher value, however there is a lagged period of time before the higher revenues are earned which reflect the value of developed versus raw land. A four-year lag was used in the calculation of these income streams with up-front development.

These other details are important to calculating the rates of return on equity.

- Rural Residential lease rates are 5% of full market value
- All land sales at full market value
- Raw land values are 1/3 of the value of commercial and residential lands which are developed
- Commercial/industrial lease rates range from 5% to 10%. A 7.5% figure was used in the analysis
- Conservation easement lease rates are 2.5% of the raw rural residential land value
- Conservation easement sales were 50% of the raw rural residential land value
- The mix of sales and leases for rural residential and commercial/industrial are as follows: 90% sales, 10% lease for rural residential and 90% lease, 10% sales for commercial/industrial

The planning team developed the following rates of conservation easement *sales* per year for each land office. They do not expect these to be a smooth rate of sales.

Table 13
Easement Sales

Alternative	CLO	ELO	NELO	NWLO	SLO	SWLO
A	173	28	209	34	6	16
B	313	57	308	59	20	35
C	422	66	410	77	32	53

In addition, they anticipate a new program of conservation easement *leases* under alternatives B and C as follows. Again these figures are expressed as annual equivalents but will likely be leased in more larger irregular amounts.

Table 14
Easement Leases

Alternative	CLO	ELO	NELO	NWLO	SLO	SWLO
A	0	0	0	0	0	0
B	47	0	0	98	12	57
C	94	0	0	197	25	94

The calculations yield the following estimated average annual rates of return on equity.

Table 16
Rate of Return on Equity For EIS Alternatives

EIS Alternative	Rate of Return on Equity*	Rate of Return on Equity
Current Situation	2.13%	2.13%
Alternative A	2.76%	2.76%
Alternative B.1	4.66%	4.73%
Alternative B.2	5.05%	5.13%
Alternative C.1	5.48%	5.55%
Alternative C.2	6.27%	6.35%

*The differences in the rates of return result form the consideration of extra conservation leases as described in the earlier in table 14

Table 17
Rate of Return on Equity For EIS Alternatives
With 50/50 Cost Share Between New Activities in Alternative A
and existing Activities

EIS Alternative	Rate of Return on Equity*	Rate of Return on Equity
Current Situation	2.13%	2.13%
Alternative A	3.87%	3.87%
Alternative B.1	4.10%	4.07%
Alternative B.2	4.50%	4.57%
Alternative C.1	5.20%	5.28%
Alternative C.2	6.00%	6.07%

*The differences in the rates of return result form the consideration of extra conservation leases as described in the earlier in table 1

You will notice that the rates of return for each EIS alternative shown in Table 16 are greater than the rate shown for existing activities. From a standpoint of investment theory, Alternative C.2 is the preferred alternative. It has the highest rate of return and each alternative is preferred to the existing situation.

Table 17 shows the rates of return where the assumption regarding the allocation of the current budget between existing activities and those envisioned under alternative A is relaxed. The costs used to calculate the rates of return in Table 17 include 50% of the current budget shown in table 15. These costs ($544,779) are added to the amounts in the additional costs item (column 3 in Table 15) in calculating the alternative rates of return on equity. Of course when costs increase, net income decreases as do rates of return on equity. However, the ranking of the EIS alternatives is not affected The rates of return for alternatives B.1, B.2, B.3, and B.4 are all considerably greater than the rate of return for Alternative A. In addition, all are considerably greater than is the current situation.

Returns on the Trust Fund

As was discussed earlier, some of the income from these programs goes into the School Trust fund and some goes directly toward the support of schools and other state institutions supported in part with trust lands. Table 16 below summarizes these transactions estimated for the trust fund.

Table 18
School Trust Account
Estimated Deposits and Earnings for the EIS Alternatives*

	Average Annual Deposits	Average Annual Earnings
EIS Alternative A	$811,143	$664,342
EIS Alternative B	$1,406,246	$1,126,982
EIS Alternative C	$2,580,376	$2,153,621

* Deposits become a permanent part of the trust fund balance. A 5% interest rate was used to calculate the interest. Deposits and earnings were averaged over the planning horizon.

Economic Impacts-Local Jobs

The economic impacts envisioned in this report may be a bit different from those commonly estimated and reported in an EIS. The view here is rather simple. The growth is going to occur. The sustentative issue is what role will state lands have in the growth and development of lands in Montana? The jobs, taxes and income reported in this and subsequent sections really represent the share of the total jobs, income and taxes that will be paid as a result of development in the state.

Table 19
Local First Year Jobs Associated with DNRC Development Share

Total	DNRC	Share	First Year	Jobs
	ALT B			
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	362.4359	262.2084	292.4809	321.2814
ELO	30.43134	12.56014	14.74876	16.13679
NELO	83.33711	65.95701	71.63639	78.92175
NWLO	542.1261	390.8496	422.1247	458.9749
SLO	141.7889	97.00023	107.9502	119.6995
SWLO	309.9033	220.6768	243.211	267.2608

First Year	Impacts	Local Jobs	ALT A	
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	181.218	131.1042	146.2404	160.6407
ELO	15.21567	6.28007	7.374378	8.068394
NELO	41.66855	32.97851	35.8182	39.46088
NWLO	271.0631	195.4248	211.0623	229.4874
SLO	70.89446	48.50012	53.97512	59.84977
SWLO	154.9516	110.3384	121.6055	133.6304

First Year	Impacts	Local Jobs	Alt C	
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	716.6148	502.0808	561.4573	618.0114
ELO	60.86268	25.12028	29.49751	32.27358
NELO	166.6742	131.914	143.2728	157.8435
NWLO	1018.895	722.1229	783.2817	854.494
SLO	277.9327	188.69	210.3685	233.5864
SWLO	594.2625	416.6725	460.8928	508.0618

These employment impacts (along with the tax and income impacts reported in the next sections) are based on a study by Adair and Heath (2002), which estimated construction impacts for both single family and multiple family housing in a number of Montana housing markets. The multiple housing impacts were modified to address the impacts of commercial/residential development. Much of the development on lands listed and taxed as "commercial" by the Montana Department of Revenue are apartment houses.

Income Impacts of the Alternatives

Reported next are the impacts or share of personal income associated with development and construction. Again these represent only the share of total personal income per EIS alternative so that if ,for example, the state share is 10% in a region, the figures in the table represent 10% of the total income.

Table 20
Share of Personal Income Associated with DNRC Development Share

Combine Local Income

First Year	Local	Income	Alt B	
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	11312739	8184331	9129227	11560823
ELO	1103781	455571.2	534954.9	585300.4
NELO	3022736	2392339	2598337	2862586
NWLO	18505157	13341423	14408978	19998887
SLO	5730102	3920061	4362583	5307220
SWLO	11712634	8340367	9192034	12101052

Combined	Local	Income	Alt A	
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	5656369	4092166	4564614	5780411
ELO	551890.4	227785.6	267477.4	292650.2
NELO	1511368	1196170	1299168	1431293
NWLO	9252579	6670712	7204489	9999443
SLO	2865051	1960031	2181291	2653610
SWLO	5856317	4170183	4596017	6050526

First Year	Local	Income	Alt C	
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	22367751	15671486	17524810	21589002
ELO	2207562	911142.3	1069910	1170601
NELO	6045472	4784678	5196674	5725171
NWLO	34779398	24649241	26736861	35665725
SLO	11232067	7625513	8501602	10144626
SWLO	22459844	15747920	17419203	22202036

The local income is the direct result of construction and construction activities. It is the "first-year income" which means that it is a conservative estimate of the total income that is associated with development. The above figures are yearly amounts. These are sustainable as long as the levels of construction are sustainable.

Tax Impacts and EIS Alternatives

The final impact included in the economic analysis is the impact of development on tax receipts. Of course, state lands are not taxed although improvements on leased state lands are. Thus, development of state lands can change the tax base in a variety of ways. The improvements on leased lands enter the tax base and the lands and improvements on lands that are sold to the private (taxed) sector enter the tax base. That complexity is a bit beyond this analysis so that these tax impacts are perhaps a bit lower than will occur since these are essentially based on the taxes (first year) that arise from the development of lands already in the tax base (perhaps in a lower valued and taxed use).

Table 21
Tax Impacts
DNRC Development Share

First Year	Impacts	Local Taxes		
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	799531.9	502793.3	567361.4	629088.8
ELO	51578.55	21288.37	24997.89	27350.49
NELO	141249.3	111791.5	121417.6	133765.7
NWLO	875662.2	578287.4	638931.8	706773.4
SLO	268069.5	177440	199023.2	222005.3
SWLO	490499.3	324670.3	364162.1	406213.6

First Year	Impacts	Local Taxes		Alt A
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	399766	251396.6	283680.7	314544.4
ELO	25789.27	10644.19	12498.95	13675.24
NELO	70624.67	55895.77	60708.81	66882.84
NWLO	437831.1	289143.7	319465.9	353386.7
SLO	134034.7	88720	99511.58	111002.7
SWLO	245249.7	162335.2	182081	203106.8

First Year	Impacts	Local Taxes		Alt C
	2002-2010	2011-2015	2016-2020	2021-2025
CLO	1599064	1005587	1134723	1258178
ELO	103157.1	42576.74	49995.78	54700.98
NELO	282498.7	223583.1	242835.2	267531.4

NWLO	1751324	1156575	1277864	1413547
SLO	536138.9	354880	398046.3	444010.6
SWLO	980998.7	649340.7	728324.1	812427.2

Summary and Concluding Remarks

Forecasts for rates of land development in commercial/ residential uses as well as rural residential uses (acreages from 1 through 25 acres) have bee made. In addition, prices have been estimate for these uses and future prices have been forecast. These are the essential parts of the plan and analysis. Based on these forecasts and various EIS alternatives developed by the DNRC staff, various measures of economic performance and impacts have been estimated. These clearly show that increases in development will add in generating income for current and future school children. Based on the economic analyses presented above, Alternative C is preferred to Alternative B and B is preferred to Alternative A.

Literature Cited

Adair, Ann L. and Cheryl Heath. 2002. The Economic Impact of Home Construction on Montana Counties. Center for Applied Economic Research. Montana State University-Billings.

Montana Department of Natural Resources and Conservation, Trust Land Management Division. "Report on Return on Asset Value by Trust and Land Office for State Trust Lands"-Fiscal Year 2003, 12/2003,

Appendix E

A COARSE FILTER PROCESS TO CLASSIFY LAND

WHEN TO APPLY THIS PROCESS

Cursory Review Of Parcel. Most parcels can be categorically disregarded. Critical elements of property rights are fundamental in making the decision to evaluate a parcel. This knowledge is acquired through familiarity of the land and reclassification procedure.

Timber Sale Projects. This process will be a tool for land managers when determining what type of timber harvest activities are appropriate on lands that are prime/focused or transitional or undetermined for alternative uses.

Grazing or Agricultural Leases. Evaluate selected leases/licenses at the time of renewal. This process will help assist the field in making a recommendation to renew leases on lands that are prime/focused or transitional or undetermined for alternative uses.

Lands Within Special Improvement Districts. State land may fall within improvement districts. The City and or County may access an annual fee to satisfy paving, sewer or water bonds.

Land Exchange - Rate - Both Parties' Land.

Lease or Land Use License Request. Evaluate the state land an applicant includes within a lease or land use license application. This process will provide you information to accept and proceed or deny the application.

Development of a Short and Long Range Plan. Parcels evaluated will provide you with information necessary to develop goals and objectives for your land office.

Granting Easements. Using this process will provide direction regarding where easements should be located within state land.

The Area Manager will designate who is responsible for using this management tool. The Special Uses Bureau will provide support.

The classification process will not provide you with a “cookbook” approach to development and land management. It will provide you the necessary information to initiate development projects; set short- and long-term goals and objectives; and request funding and FTE.

INSTRUCTIONS FOR CLASSIFICATION

Step 1: Select state land to classify.

Step 2: Evaluate selected state land under the following scoring methodology.

1. Explanation of how to score and evaluate:

   a) Multiply the rate times the weight for each category under legally permissible and physically possible.

   b) The lower the score, the greater the potential the property has for development

   c) The category and respective weight may not contribute to the overall score, but may be a key factor in developing or not developing a state section or parcel. For example, a contaminated/hazardous site would score a rating of 4 (4 x 18 = 72), and the rest of the criteria results in a total score indicating a Tier I rating. The contamination may prohibit our development, making this parcel less attractive.

   d) Utilize the comment section to support your rate factor. This information is helpful for permanent records.

1. With the above information, rate your parcel.

   a) First rate the parcel under the Legally Permissible criteria. If the total score if less than or equal to 145, the parcel would be consider a prime/focused parcel. Proceed to B. If the score is higher and the factors indicate the parcel is transitional or undetermined property, document why on the form and recommend no action or consider further as a land exchange candidate.

   b) Rate the parcel under the Physically Possible criteria. Scores less than or equal to 120 on scoring sheet indicate the parcel is considered a prime/focused parcel. If the score is higher and the factors indicate the parcel is transitional or undetermined property, document why on the form and recommend no action or consider further as a land exchange candidate. If the score is greater than 120, but the combined score is less than 265, proceed to Step 3 below. If the score exceeds 265, the parcel is transitional or undetermined property; document why on the form and recommend no action or consider further as a land exchange candidate.

On the following pages are examples of two parcels that were scored and evaluated with the criteria.

Step 3: Evaluate the parcel under Other Factors to Consider. These factors will result in a positive, negative or no effect rating. Complete the comment section and score how these other factors influence the parcel you are rating. Offset the positives and negatives overall. If the negative factors overpower the previous evaluation, document no further action should be considered. If not, proceed to Step 4 as shown on flow chart.

Step 4 Evaluate the parcel under Administrative/Internal Factors to Consider. Proceed as described in Step 3 above.

Step 5: Area/Unit Office will use this information to develop a short- and long-range management plan and forward the recommendation to the appropriate Bureau.

Step 6: Special Uses Bureau, in association with the Area Office, will schedule the parcel for development.

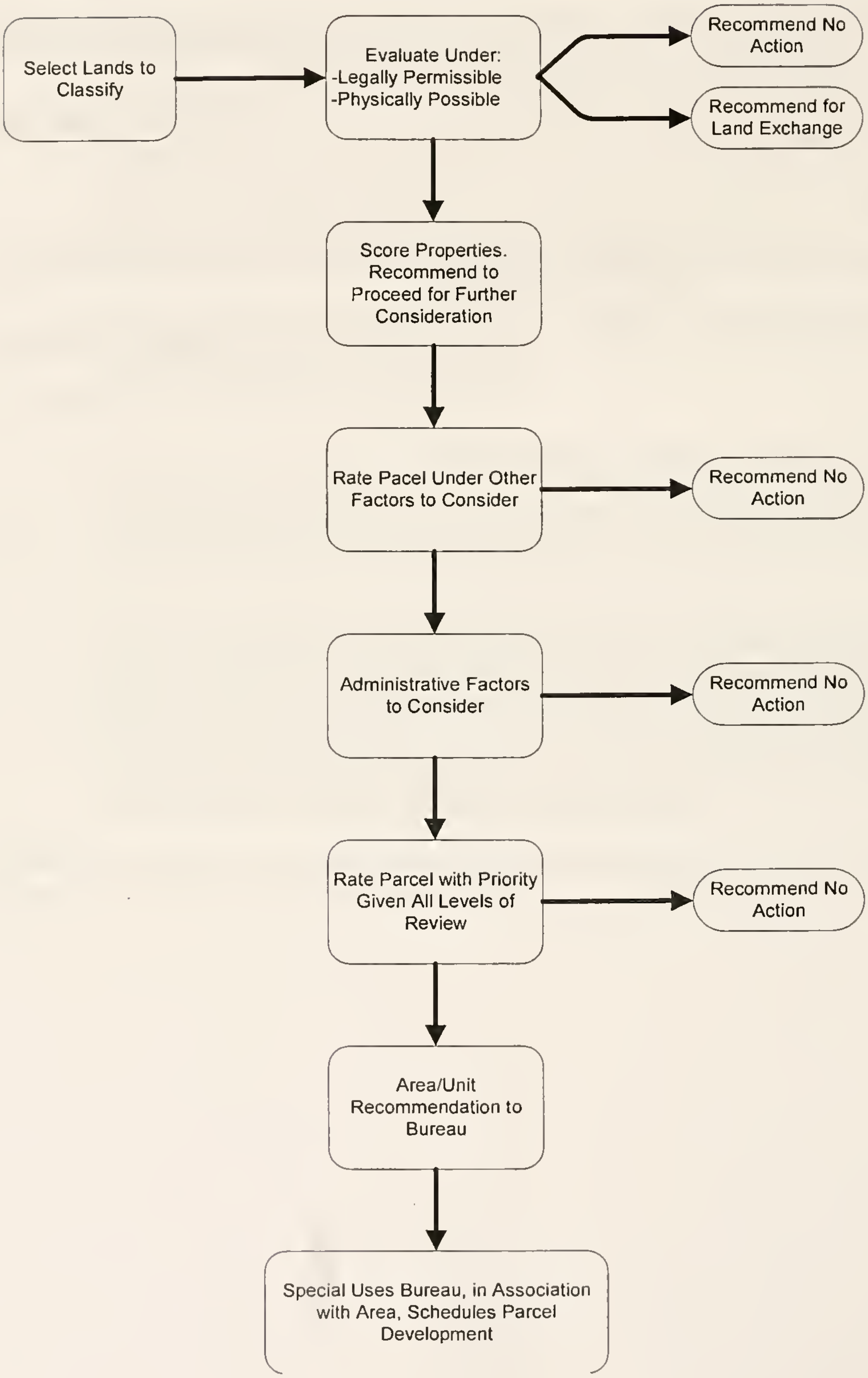
Definitions:

Tier I Prime/Focused Lands: Lands with short-term potential for development according to the classification guidelines.

Tier II Transitional/Undetermined Lands: Lands with long-term or no potential for development according to the classification guidelines.

(Forward Evaluations to Special Uses Bureau)

COARSE FILTER PROCESS FLOW CHART


Select Lands to Classify
Evaluate Under:
-Legally Permissible
-Physically Possible
Recommend No Action
Recommend for Land Exchange
Score Properties. Recommend to Proceed for Further Consideration
Rate Pacel Under Other Factors to Consider
Recommend No Action
Administrative Factors to Consider
Recommend No Action
Rate Parcel with Priority Given All Levels of Review
Recommend No Action
Area/Unit Recommendation to Bureau
Special Uses Bureau, in Association with Area, Schedules Parcel Development

STATE LAND
Legal ______________________________ NAME OF PREPARER: ____________________ DATE:
Section _____ Township ______ Range _____ Acres

LEGALLY PERMISSIBLE				
CATEGORY	**COMMENTS**	**RATING 1-4**	**WEIGHT**	**SCORE**
Water Rights			14	
Access			11	
Environmental Laws/Regulations			7	
Zoning			7	
Leases			5	
Mineral Ownership			5	
Easement ROW			2	
TOTAL LEGALLY PERMISSIBLE				

Recommendations:

LEGALLY PERMISSIBLE
Water Rights
(Optional Category--Dependent on Use)

Weight		Rating (1-4)	Factor
14	Water Rights	1-2	Subsurface water rights.
		3-4	Water rights exist for development permitted for aquifer.

Information available from Hydrologist/Water Rights Specialist, TLMD.
Well logs may be available for surrounding users.

LEGALLY PERMISSIBLE
Access

Weight		Rating (1-4)	Factor
11	Access	1	Legal access for all purposes to property for development.
		2	No access within 1-5 miles. Cooperator & access is easily obtainable.
		3	No access.

Check county records, section record cards.

LEGALLY PERMISSIBLE
Environmental Laws/Regulations

Weight		Rating (1-4)	Factor
7	Prime/Focused Lands	1-2	None impacting the property.
7	Transitional/Undetermined Lands	3-4	Environmental laws/regulations impact the property; i.e., threatened & endangered or sensitive species.

Need input from experts relative to the ability to map the impact of environmental laws and regulations. MEPA analysis is considered under administrative factors that will impact the project.

LEGALLY PERMISSIBLE
Zoning

Weight		Rating (1-4)	Factor
7	Zoning	1	Urban/rural use designated if appropriate for subject.
		2	Zoning undetermined. Not zoned, but planning office views favorable zoning.
		3	Development is not compatible with zoning, land use plans.

Contact county planning offices.
Will determine which zoning designations are desirable for mixed use development.

LEGALLY PERMISSIBLE
Leases

Surface lease exists that would impact development.

Weight		Rating (1-4)	Factor
5	Leases	1-2	No lease 1; lease not precluding alternative use 2.
		3-4	Leases may preclude alternative use.

Check STLMS.
How long till lease expires?

LEGALLY PERMISSIBLE
Mineral Ownership

Weight		Rating (1-4)	Factor
5	Mineral Ownership	1	State surface/State subsurface/no mineral leases.
		2	State surface/State subsurface/State mineral leases & mineral potential.
		3	State surface/private or Federal sub./No Fed. claims known.
		4	State surface/private or Federal sub./Fed. claims known & mineral potential.

Check STLMS & Minerals Bureau

LEGALLY PERMISSIBLE
Encumbrances

Weight		Rating (1-4)	Factor
2	Encumbrances	1	No easements issued within property.
		2-4	Easements issued within State property that may impact management.

Check with Lisa Axline and STLMS for information.

TRANSITIONAL/UNDETERMINED LANDS
LEGALLY PERMISSIBLE

Weight	Criteria	Rating (1-4)	Factor
14	Water Rights	3-4	Water rights do not exist.
11	Access	2-4	No access within 1-5 miles.
7	Environmental Laws/Regulations	3-4	None impacting the property.
7	Zoning	3-4	Rural use designated; zoning undetermined.
5	Leases	3-4	Leases may preclude alternative use (03 < or = 10 years).
5	Mineral Ownership	3-4	State surface/Federal sub./No Fed. claims known.
2	Easements/ROW	3-4	Easements/ROW limit development.
100			

TOTAL SCORE: 237

*Scores less than 145 or equal to 145 are in Tier I. Scores greater than 145 and less than or equal to 240 are in Tier II.

PRIME/FOCUSED LANDS
LEGALLY PERMISSIBLE

Weight	Criteria	Rating (1-4)	Factor
14	Water Rights	1	Water rights exist.
11	Access	1	Legal access to property.
7	Environmental Laws/Regulations	1	None impacting the property.
7	Zoning	1	Urban use designated.
5	Leases	1	No leases.
5	Mineral Ownership	1	State surface/State subsurface/no mineral leases.
2	Easements/ROW	1-2	No easement/ROW barriers exist. No limitations exist.
7	Threatened & Endangered Species	1-2	Bald eagle - grizzly bear.
100			

TOTAL SCORE: 237

*Scores less than or equal to 145 are in Tier I.

PHYSICALLY POSSIBLE
Infrastructure

Weight		Rating (1-4)	Factor
6	Roads	1	Paved or county gravel road--maintained.
		2	Private primary road.
		3	Secondary road.
		4	Spur or no road.
6	Sewer	1	Sewer developable.
		2	Septic developable--more than 5 units or 1 commercial.
		3	Less than 5 units or 1 commercial.
		4	Develop treatment plant; sewer 2-3 miles away.
6	Power	1	Power to site.
		1	Area typically developable without power.
	Note: Contact power company to determine rating if appropriate.	2	Power within □ mile for commercial.
		3	Power within 1 mile for commercial.
		4	Power further than 1 mile.

PHYSICALLY POSSIBLE
Contaminated/Hazardous Sites/Landfill

Weight		Rating (1-4)	Factor
9	Contamination	0	No contamination.
		1-2	Contamination affects site from surrounding land use, depending on degree of effect.
		4	Contamination on site.

PHYSICALLY POSSIBLE
Water Availability

Weight		Rating (1-4)	Factor
18	Water Availability	1	Hook into city system or
		1	0-300 ft. well depth. Gallons per minute (GPM) reg. necessary for type of development anticipated.
		2	Greater than 300, less than 1,000 ft. well depth. Marginal GPM.
		3	Greater than 1,000 ft. well depth. Good GPM.
		4	Greater than 1,000 ft. well depth.

Distance to account for the progression of urban growth.

PHYSICALLY POSSIBLE
Geologic Features (Detriments)

Weight		Rating (1-4)	Factor
13	Geologic Features (Detriments)	1	Soil stable for the majority of the parcel.
		1	Not prone to slumping.
		2	Minor subsidence for the developable portion of the parcel.
		3-4	Slumps, high clay and some high water table for the majority of the parcel.

Soils maps available (NRCS).

PHYSICALLY POSSIBLE
Lease Improvements

Improvements would be impacted if parcel was developed or eliminated if developed.

Weight		Rating (1-4)	Factor
11	Lease Improvements	1-2	No improvements - minimal improvements.
		3-4	Improvements exist - extensive, high cost improvements..

Check lease records.

PHYSICALLY POSSIBLE
Floodplains
(0 pts. if not in floodplain)

Majority of developable parcel.

Weight		Rating (1-4)	Factor
11	Floodplains	1-2	Drainage plan exists.
		3-4	Floodplain and no drainage plan.

Check 50-100 year floodplain maps available from county.

PHYSICALLY POSSIBLE
Topography

Identify majority of parcel that is developable.

Weight		Rating (1-4)	Factor
11	Topography	1-2	All land has < 10%-25% slope line.
		3-4	Land = or > 25% slope line.

TRANSITIONAL/UNDETERMINED LANDS
PHYSICALLY POSSIBLE

Weight	Criteria	Rating (1-4)	Factor
9	Infrastructure	3-4	Sewer
9	Infrastructure	3-4	Power
18	Contaminated/Hazardous Sites	2-4	0-1.0 mile away from contamination.
18	Water Availability	3-4	2.1-5.0 miles away from water service area.
13	Geologic Features (Detriments)	1-2	No subsidence.
11	Improvements	2	Improvements exist.
11	Floodplains	2	Floodplain and no drainage plan.
11	Topography	3	Land = or > 25% slope line.
100			

TOTAL SCORE: 234

*Scores greater than 120 are in Tier II.

MIXED USE DEVELOPMENT
PRIME/FOCUSED LANDS
PHYSICALLY POSSIBLE

Weight	Criteria	Rating (1-4)	Factor
18	Infrastructure	1-2	Water and sewer developable.
18	Contaminated/Hazardous Sites	1	No contamination.
18	Water Availability	1-2	Within water service area (CNN□s). Developable well.
13	Geologic Features (Detriments)	1	No subsidence.
11	Improvements	1	No improvements.
11	Floodplains	1	Drainage plan exists.
11	Topography	1-2	All land has < 10%-25% slope line.
	Power, phone?		
100			

TOTAL SCORE: 100

*Scores less than or equal to 120 are in Tier I;
scores greater than 120 are in Tier II.

STATE LAND
Legal ______________________ Section _____ Township _____ Range _____ Acres

NAME OF PREPARER: ______________________ DATE:

PHYSICALLY POSSIBLE				
CATEGORY	**COMMENTS**	**RATING 1-4**	**WEIGHT**	**SCORE**
Roads			6	
Sewer			6	
Power			6	
Contamination			9	
Water Availability			18	
Geologic Features/Detriments			13	
Improvements			11	
Flood Plains			11	
Topography			11	
TOTALLY PHYSICALLY POSSIBLE				
TOTAL LEGALLY PERMISSIBLE AND PHYSICALLY POSSIBLE				

Recommendations:

OTHER FACTORS TO CONSIDER

Rate as: + Positive
- Negative
0 No Impact

FACTORS	COMMENT	RATING
Distance to Urban Center		
Distance to National Parks, Wilderness and National Forests, BLM Land & BOR Land		
Other Amenities Such As Views, Creeks, Rivers, Lake		
Surrounding Land Uses		
Potential to Develop Conservation Leases for Development, Timber Wildlife and Esthetics		
Development Potential & Flexibility		
Existing RID□s or SID□s		
Potential RID□s or SID□s		
Unauthorized Uses on Parcel		
Supply and Demand for Development		

ADMINISTRATIVE FACTORS TO CONSIDER

Rate as: + Positive
- Negative
0 No Impact

FACTORS	COMMENT	RATING
Current Income		
Future Income Potential		
Management or Administration		
MEPA Review		
Political Considerations		

(Funding of the project will be considered in association with the Bureau and Area)

Overall Rating:

Recommendations:

APPENDIX F

SENSITIVE PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LANDS

TABLE
RARE VASCULAR PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LAND

NAME	Vegetation Province	HABITAT
Allium columbiana Columbia onion	Northern Rocky Mountains	Moist swales and along temporary ponds and streams in the valleys. 2800 - 3000 feet (853 - 914 meters)
Amerorchis rotundifolia round-leaved orchid	Northern Rocky Mountains	Spruce forest around seeps or along streams, often in soil derived from limestone. 3350 - 5920 feet (1021 – 1804 meters)
Aquilegia formosa sitka columbine	Middle and Yellowstone Plateau	Moist soil of open coniferous, cottonwood, or aspen forests in the montane to subalpine zone. 6700 - 8400 feet (2042 – 2560 meters)
Arabis fecunda sapphire rockcress	Northern Rocky Mountains	Open, rocky, often eroding slopes developed from calcareous parent material in the foothills and montane zones, restricted to the contact zone with igneous rock. 4200 - 7960 feet (1280 - 2426 meters)
Astragalus barrii Barr's milkvetch	Great Plains	Gullied knolls, buttes, and barren hilltops, often on calcareous soft shale and siltstone. 2940 - 4000 feet (896 - 1219 meters)
Astragalus ceramicus var. apus painted milkvetch	Middle Rocky Mountains	Sparsely vegetated sand dunes in the valley zone. 6680 - 6700 feet (2036 - 2042 meters)
Astragalus grayi Gray's milkvetch	Temperate Desert	Open soil in sagebrush steppe in the valley zone. 3700 - 5500 feet (1128 - 1676 meters)
Astragalus scaphoides Bitterroot milkvetch	Middle Rocky Mountains	Silty, often stony soil in sagebrush grassland in the valley and foothill zones. 5300 - 7160 feet (1615 - 2182 meters)
Astragalus terminalis railhead milkvetch	Middle Rocky Mountains	Sagebrush steppe and sparsely-vegetated grasslands in the valley, foothills, montane and alpine zones. 5000 - 9560 feet (1524 - 2914 meters)
Athysanus pusillus sandweed	Middle Rocky Mountains	Vernally moist, shallow soil of steep slopes and cliffs in the lower montane zone. 4000 - 4800 feet (1219 - 1463 meters)
Bidens beckii Beck water-marigold	Northern Rocky Mountains	Still or slow-moving water of lakes, rivers, and sloughs in the valleys, 0.1-3 m deep. 3000 - 4000 feet (914 - 1219 meters)
Botrychium ascendens upwardlobed moonwort	Northern Rocky Mountains	Stream floodplain habitats dominated by deciduous shrubs with lush cover by forbs, graminoids, and mosses in nw. MT. Reported from mesic meadows in OR and western red cedar habitats in ID and WA; possibly also occurring in these habitats in Montana. 3330 - 4800 feet (1015 - 1463 meters)
Botrychium crenulatum wavy-leaved moonwort	Northern and Middle Rocky Mountains	Stream bottoms, around seeps, on the edges of marshes, and in wet roadside swales, often on soils influenced by reprecipitated calcium. Vegetation dominated by spruce, alders, and dogwood, with high cover and diversity of forbs and graminoids. Also reported from western red cedar habitats. 2440 - 7680 feet (744 - 2341 meters)
Botrychium montanum mountain moonwort	Northern and Middle Rocky Mountains	Usually in deep litter of springy, mature western red cedar forests, but also in riparian thickets, mesic meadows, and grassy trail edges. 2640 - 4900 feet (805 - 1494 meters)
Botrychium pendunculosum stalked moonwort	Northern Rocky Mountains	Floodplain bottoms of glaciated valleys with mature western red cedar. Growing in stratified litter and alluvium layers in old stream channel bottoms. 2600 - 3660 feet (792 - 1116 meters)
Carex chordorrhiza creeping sedge	Northern and Middle Rocky Mountains	Wet, organic soil of SPHAGNUM fens in the montane zone. 3410 - 5280 feet (1039 - 1609 meters)
Carex crawei Craw's sedge	Middle Rocky Mountains and Great Plains	Gravelly or sandy, calcareous seepage zones of ponds, streams and springs in the valley to foothill zones and on the plains. 3280 - 4900 feet (1000 - 1494 meters)
Carex livida pale sedge	Northern, Middle Rocky Mountains and Great Plains	Wet, organic soils of fens in the foothill and montane zones. 2910 - 6030 feet (887 - 1838 meters)
Carex parryana spp. idahoa Idaho sedge	Middle Rocky Mountains	Moist meadows around seeps, ponds, or streams, usually associated with calcareous parent materials in the foothills to montane zones. 4500 - 8420 feet (1372 - 2566 meters)
Carex scoparia pointed broom-sedge	Middle Rocky Mountains	Wet soil along rivers and sloughs in the valleys. 3070 - 4300 feet (936 - 1311 meters)

TABLE
RARE VASCULAR PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LAND

NAME	Vegetation Province	HABITAT
Carex sychnocephala many-headed sedge	Northern Rocky Mountain Forest and Great Plains	Moist soil of meadows along streams and ponds in the valleys and on the plains. 2150 - 5100 feet (655 - 1554 meters)
Castilleja exilis annual Indian paint brush	Middle and Yellowstone Plateau	Moist alkaline meadows in the valley zone. 3860 - 5320 feet (1177 - 1622 meters)
Centunculus minimus chaffweed	Northern, Middle Rocky Mountains and Great Plains	Vernally wet, sparsely vegetated soil around ponds and along rivers and streams in the valleys and on the plains. 3200 - 3300 feet (975 - 1006 meters)
Chenopodium subglabrum smooth goosefoot	Great Plains	Sparsely vegetated sand dunes and sandy terraces of major rivers on the plains. 2400 - 3450 feet (732 - 1052 meters)
Chrysoplenium tetrandrum Northern golden-carpet	Middle Rocky Mountains	Seeps, wet rock ledges, and stream banks in the montane zone. 4100 - 6700 feet (1250 - 2042 meters)
Cleome lutea yellow bee-plant	Temperate Desert	Open, often sandy soil of sagebrush steppe in the valleys. 4100 - 4600 feet (1250 - 1402 meters)
Cryptantha fendleri Fendler cat's-eye	Yellowstone Plateau and Great Plains	Open areas of sand dunes in the valleys and on the plains. 1970 - 6700 feet (600 - 2042 meters)
Cyperus schweinitzii Schweinitz flatsedge	Great Plains	Sparsely vegetated sand dunes on the plains. 2100 - 3445 feet (640 - 1050 meters)
Cypripedium fasciculatum clustered ladies slipper	Northen Rocky Mountains	Dry to moist forests in the montane zone. 2995 - 4700 feet (913 - 1433 meters)
Cypripedium parviflorum small yellow ladies-slipper	Northern, Middle Rocky Moutains, Yellowstone Plateau	Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in the valley to lower montane zones. 2520 - 6200 feet (768 - 1890 meters)
Cypripedium passerinum sparrow's-egg ladies-slipper	Northern Rocky Mountains	Mossy, moist, or seepy places in coniferous forests, often on calcareous substrates. 3100 - 5700 feet (945 - 1737 meters)
Dalea villosa var. villosa silky prairie clover	Great Plains	Loose sand of sand dunes or eroded from sandstone outcrops. 1980 - 3430 feet (604 - 1045 meters)
Dichanthelium oligosanthes var. scribnerianum Scribner's panic grass	Northern Rocky Mountains and Great Plains	Open ponderosa pine woodlands of valleys and plains. 3120 - 3920 feet (951 - 1195 meters)
Drosera angelica English sundew	Northern, Middle Rocky Moutains, Yellowstone Plateau	With SPHAGNUM moss in wet, organic soils of fens in the montane zone. 3100 - 9000 feet (945 - 2743 meters)
Dryopteris cristata Buckler fern	Northern and Yellowstone Plateau	Moist to wet, often organic soils at the forest margins of fens and swamps in the montane zone. 2950 - 7350 feet (899 - 2240 meters)
Elatine brachysperma short-seeded waterwort	Middle and Yellowstone Plateau	Shallow waters, shores and mudflats of lakes and ponds in valleys. 3000 - 6700 feet (914 - 2042 meters)
Eleocharis rostellata beaked spikerush	Northern and Middle Rocky Mountains	Wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones. 2700 - 6100 feet (823 - 1859 meters)
Elymus flavescens sand wildrye	Middle Rocky Mountains	Sparsely-vegetated sand dunes in the valleys. 6680 feet (2036 meters)
Epipactis gigantea giant helleborine	Northern, Middle Rocky Mountains, Yellowstone Plateau	Stream banks, lake margins, fens with springs and seeps, often near thermal waters. 2900 - 6200 feet (884 - 1890 meters)
Erigeron asperugineus Idaho fleabane	Middle Rocky Mountains	Open soil and scree in the alpine zone. 6000 - 10000 feet (1829 - 3048 meters)
Erigeron lackschewitzii Lackschewitz fleabane	Middle Rocky Mountains	Open, gravelly, calcareous soil and talus on ridgetops in the alpine and subalpine zones. 6400 - 8400 feet (1951 - 2560 meters)
Eriogonum caespitosum mat buckwheat	Middle Rocky Mountains	Dry, stony limestone sagebrush steppe. 6900 - 7400 feet (2103 - 2256 meters)
Eriophorum gracile slender cottongrass	Northern Rocky Mountains	Wet, organic soil of fens in the valley and montane zones. 3080 - 7600 feet (939 - 2316 meters)
Grayia spinosa spiny hopsage	Temperate Desert	Dry, alkaline soils in desert shrubland of valleys. 4200 - 5000 feet (1280 - 1524 meters)
Grindelia howellii Howell's gum-weed	Middle Rocky Mountains	Vernally moist, lightly disturbed soil adjacent to ponds and marshes, as well as similar human-created habitats, such as roadsides and grazed pastures. 3320 - 5960 feet (1012 - 1817 meters)

TABLE
RARE VASCULAR PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LAND

NAME	Vegetation Province	HABITAT
Haplopappus carthamoides var. subsquarrosus Beartooth large-flowered goldenweed	Temperate Desert	Grassland and sagebrush steppe on sandy calcareous soils in the foothills and montane zones. 5520 - 7200 feet (1682 - 2195 meters)
Howellia aquatilis water howellia	Northern Rocky Mountains	Small, vernal, freshwater glacial ponds and oxbow sloughs in the valley zone. 3100 - 4425 feet (945 - 1349 meters)
Idahoa scapigera scalepod	Middle Rocky Mountains	Vernally moist, open soil on rock ledges in the lower montane zone. 4600 - 4600 feet (1402 - 1402 meters)
Kobresia simpliciuscula scalepod	Northern, Middle and Yellowstone Plateau	Moist tundra in the alpine zone. 4570 - 9000 feet (1393 - 2743 meters)
Leptodactylon caespitosum Leptodactylon	Temperate Desert	Dry, barren hills, in rocky soils or in crevices of outcrops in the valley zone. 4350 - 5100 feet (1326 - 1554 meters)
Lesquerella carinata var. languida garnet bladderpod	Middle Rocky Mountains	Gravelly, calcareous grassland slopes in the foothills zone. 4250 - 5600 feet (1295 - 1707 meters)
Lesquerella lesicii Lesica's bladderpod	Temperate Desert	Gravelly, limestone-derived soil of open ridges and slopes among Douglas-fir and mountain mahogany woodlands in the montane zone. 5300 - 7600 feet (1615 - 2316 meters)
Lewisia pygmaea var. nevadensis Nevada bitterroot	Middle Rocky Mountains	Vernally moist, shallow soil of meadows and open forest in the montane and subalpine zones. 5040 - 7000 feet (1536 - 2134 meters)
Liparis loeselii Loesel's twayblade	Northern Rocky Mountains	Wet, organic soils of calcareous fens in the valley and montane zones. 3100 - 3300 feet (945 - 1006 meters)
Lobelia spicata pale-spiked lobelia	Great Plains	Moist meadows on the plains. 1930 - 2005 feet (588 - 611 meters)
Lomatium attenuatum taper-tip desert-parsley	Middle Rocky Mountains	Gravelly, limestone-derived slopes of sparsely vegetated sagebrush steppe or woodlands with Rocky Mountain juniper, Douglas fir, limber pine, or mountain mahogany in the foothill and montane zones. 5780 - 8900 feet (1762 - 2713 meters)
Lomatium nuttallii Nuttall desert-parsley	Great Plains	Dry, rocky slopes of open pine woodland in the plains. 3600 feet (1097 meters)
Maianthemum canadense var. interius wild lily-of-the-valley	Great Plains	Moist, humic soil in riparian forest on the plains. 3430 feet (1045 meters)
Mentzelia nuda bractless mentzelia	Great Plains	Sandy or gravelly soil of open hills and roadsides on the plains. 2010 - 2500 feet (613 - 762 meters)
Mimulus nanus dwarf purple monkeyflower	Middle Rocky Mountains	Dry, open, often gravelly or sandy slopes in the valleys and foothills. 4340 - 6700 feet (1323 - 2042 meters)
Nyphaea tetragona spp. leibergi pygmy water-lily	Northern Rocky Mountains	Quiet, fresh water of lakes and backwater sloughs in the valleys. 2890 - 3100 feet (881 - 945 meters)
Ophioglossum pusillum adder's tounge	Northern Rocky Mountains	Wet meadows, margins of fens, and gravelly moist soil in the valley and montane zones. 2920 - 4450 feet (890 - 1356 meters)
Penstemon lemhiensis Lemhi beardtounge	Middle Rocky Mountains	Open sagebrush and woodland slopes in foothill to lower subalpine zones. 4150 - 8200 feet (1265 - 2499 meters)
Potamogeton obtusifolius blunt-leaved pondweed	Northern Rocky Mountains	Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones. 3080 - 5200 feet (939 - 1585 meters)
Primula incana mealy primrose	Middle Rocky Mountains and Great Plains	Alkaline meadows in valley and foothill zones, and plains. 2044 - 7000 feet (623 - 2134 meters)
Psilocarphus brevissimus var. brevissimus dwarf wooly-heads	Northern Rocky Mountains and Great Plains	Drying mud of ponds and other vernally wet soil in the valleys and on the plains. 2300 - 3400 feet (701 - 1036 meters)
Quercus macrocarpa bur oak	Great Plains	Low, shale-derived hills on the plains. 3435 - 3650 feet (1047 - 1113 meters)
Salix serissima autumn willow	Northern and Middle Rocky Mountains	Fens and swamps in the valley and foothill zones. 4200 - 5000 feet (1280 - 1524 meters)
Scheuchzeria palustris pod-grass	Northern Rocky Mountains	Wet, organic soil of fens in the valley and montane zones, usually with SPHAGNUM moss. 2950 - 6550 feet (899 - 1996 meters)
Scirpus cespitosus tufted club-rush	Northern Rocky Mountains	Wet meadows and sphagnum bogs in the montane to alpine zones. 3200 - 9200 feet (975 - 2804 meters)

TABLE
RARE VASCULAR PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LAND

NAME	Vegetation Province	HABITAT
Scirpus subterminalis water bullrush	Northern and Middle Rocky Mountains	Open water and boggy margins of ponds, lakes, and sloughs at 0.1-3 m depth in the valley, foothill, and montane zones. 2890 - 6000 feet (881 - 1829 meters)
Solidago ptarmicoides prairie aster	Great Plains	Open, dry grasslands, often on sandy soil or limestone on the plains. 2020 - 3550 feet (616 - 1082 meters)
Solidago sparsiflora few-flowered goldenrod	Great Plains	Sandy soil of grasslands or open woodlands on the plains. 3220 feet (981 meters)
Sphaeromeria argentea chicken sage	Great Plains	Shallow limestone-derived soil in sagebrush steppe in the valley and foothill zones. 5900 - 7200 feet (1798 - 2195 meters)
Spiranthes diluvialis Ute ladies tresses	Middle Rocky Mountains	Meandered wetlands and swales in broad, open valleys, at margins with calcareous carbonate accumulation. 4050 - 5080 feet (1234 - 1548 meters)
Sporobolus asper longleaf dropseed	Great Plains	Open forests and grasslands on the plains. 2470 - 3500 feet (753 - 1067 meters)
Sporobolus neglectus small dropseed	Middle Rocky Mountains and Great Plains	Grasslands in the valleys and on the plains; both natural and disturbed habitats are represented in MT. 2500 - 4900 feet (762 - 1494 meters)
Stephanomeria spinosa spiny skeletonweed	Middle Rocky Mountains	Dry grasslands in the valley and foothill zones. 4920 - 6660 feet (1500 - 2030 meters)
Sullivantia hapemanii var. hapemanii Wyoming sullivantia	Temperate Desert	Calcareous springs and seeps on moist canyon walls, streambank outcrops, and in close proximity to waterfalls. 3700 - 5800 feet (1128 - 1768 meters)
Thelypodium paniculatum Northwestern thelypody	Middle Rocky Mountains	Wet, often alkaline meadows in the valley to montane zones. 6760 - 6800 feet (2060 - 2073 meters)
Thlaspi parviflorum small-flowered pennycress	Middle and Yellowstone Plateau	Moist to dry meadows and limestone cliffs in the montane to alpine zones. 6880 - 10100 feet (2097 - 3078 meters)
Trifolium gymnocarpon hollyleaf clover	Middle Rocky Mountains	Open woods and slopes, usually in dry soil of sagebrush steppe to ponderosa pine forest in the foothills to lower montane zone. 4800 - 6300 feet (1463 - 1920 meters)

TABLE
RARE NON-VASCULAR PLANT SPECIES OCCURRING ON STATE SCHOOL TRUST LAND

NAME	Vegetation Province	HABITAT
Aloina brevirostris short-beaked rigid screw moss	Northern Rocky Mountains	Likely in moist conifer forests
Amblyodon dealbatus	Northern Rocky Mountains	Likely in moist conifer forests
Collema curtisporum	Northern Rocky Mountains	Moist riparian forests, almost always on *Populus trichocarpa*

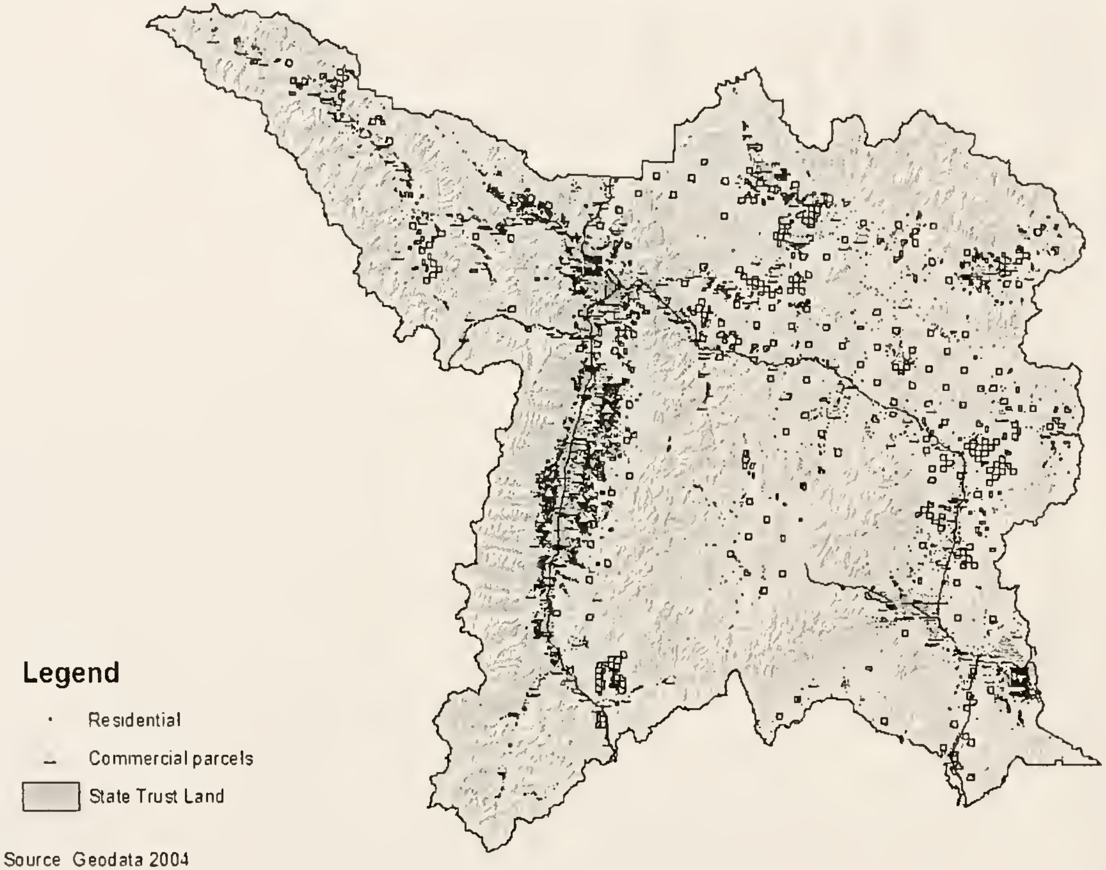
APPENDIX G

Relationship of Growth to Trust Lands
(series of maps)

Prepared for DNRC State Trust Land
Trust Land Management Division
Real Estate Management Bureau

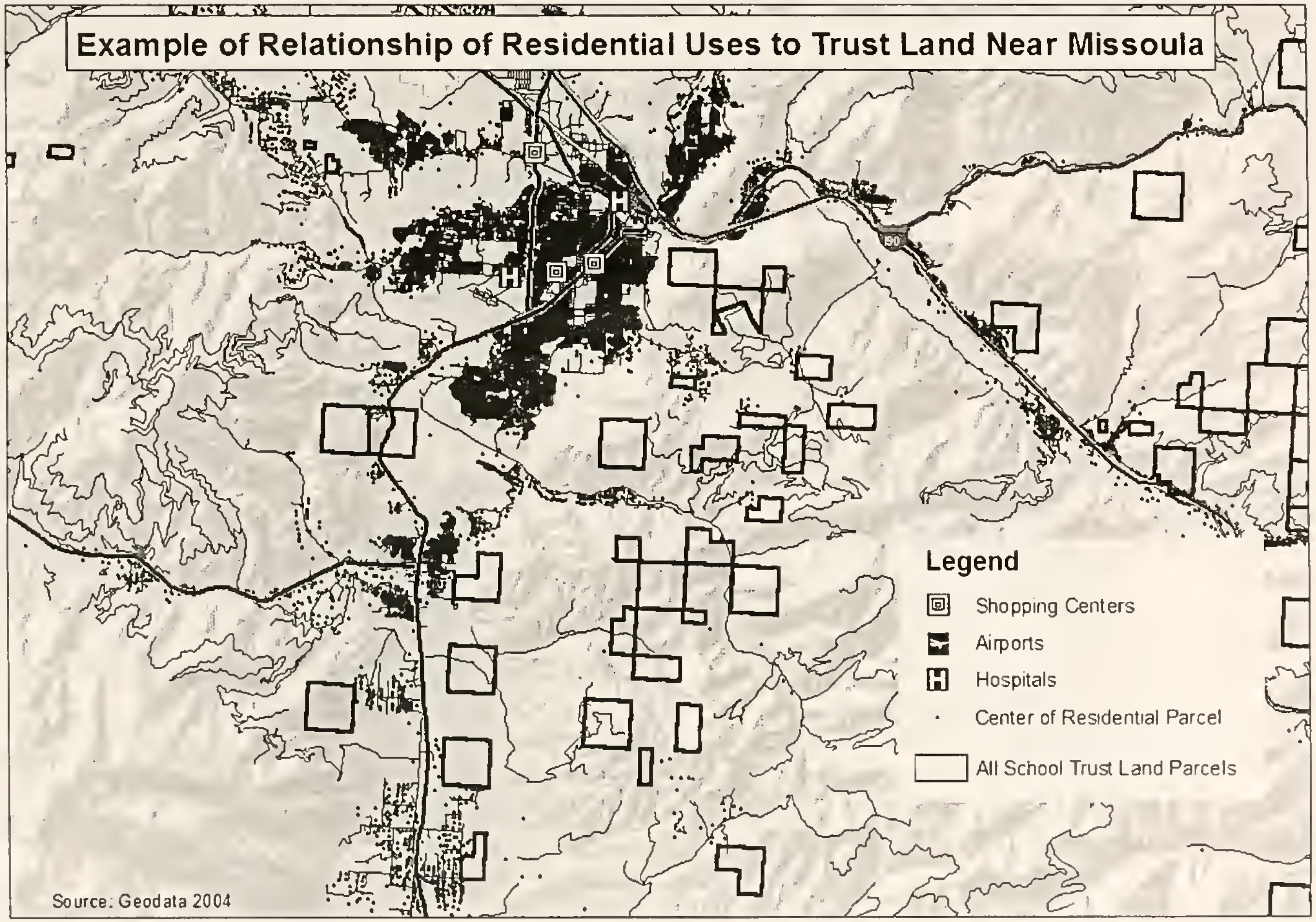
Prepared by Geodata Services, Inc.
104 South Ave. E.
Missoula, Mt. 59801

Locations of Industrial, Commercial and Residential Uses in SWLO

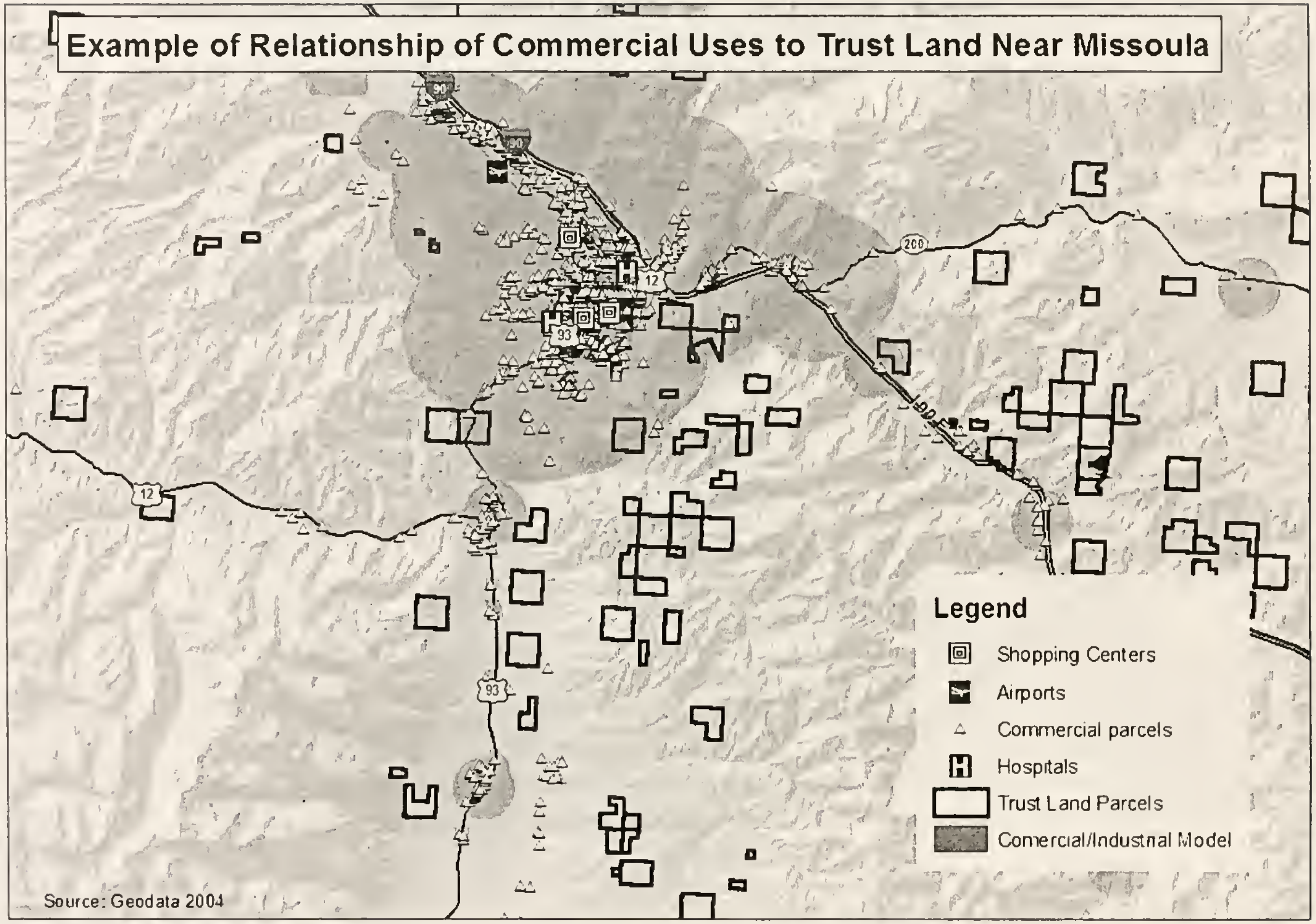


Source Geodata 2004

Example of Relationship of Residential Uses to Trust Land Near Missoula

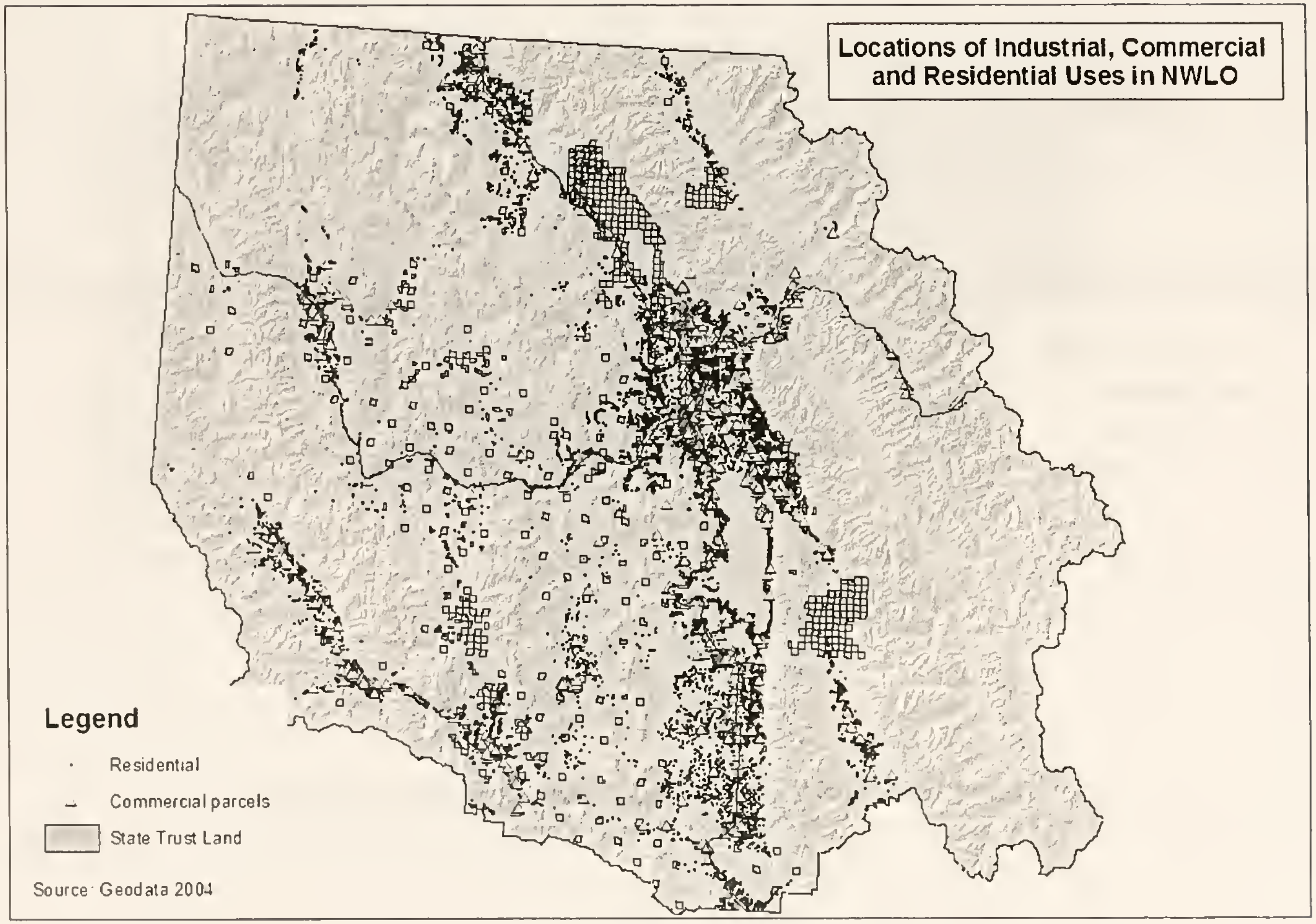


Source: Geodata 2004



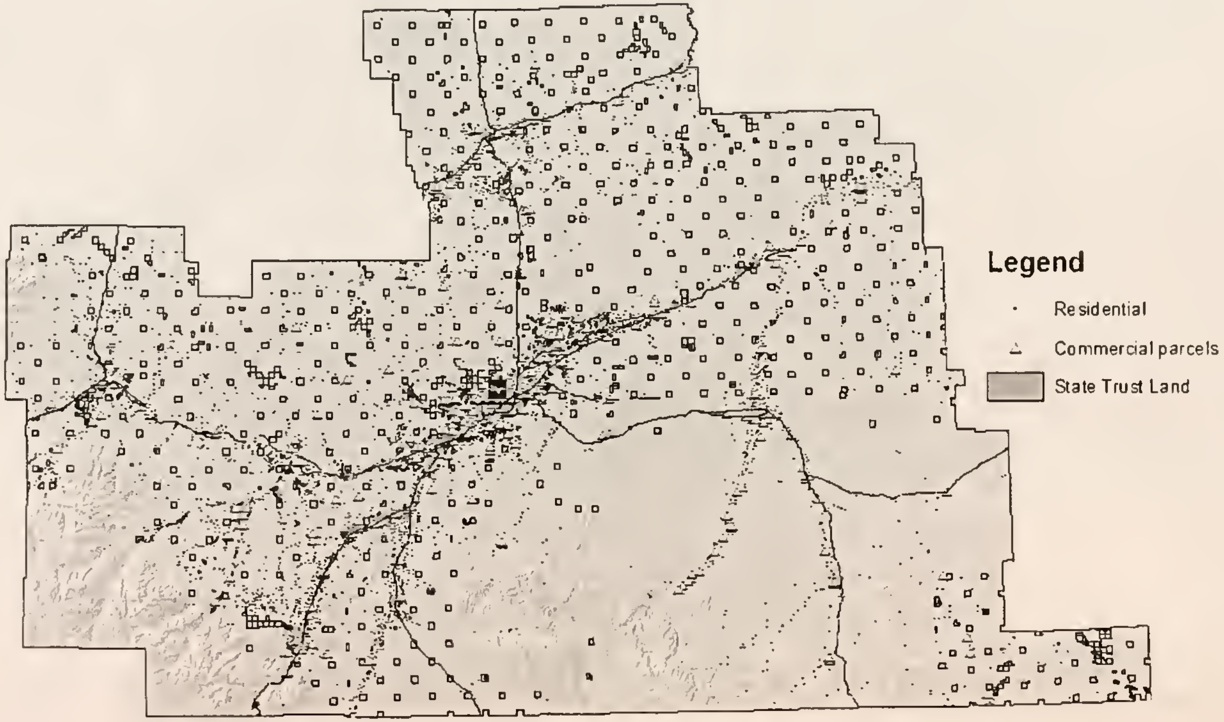
Example of Relationship of Commercial Uses to Trust Land Near Missoula

Source: Geodata 2004


Locations of Industrial, Commercial and Residential Uses in NWLO

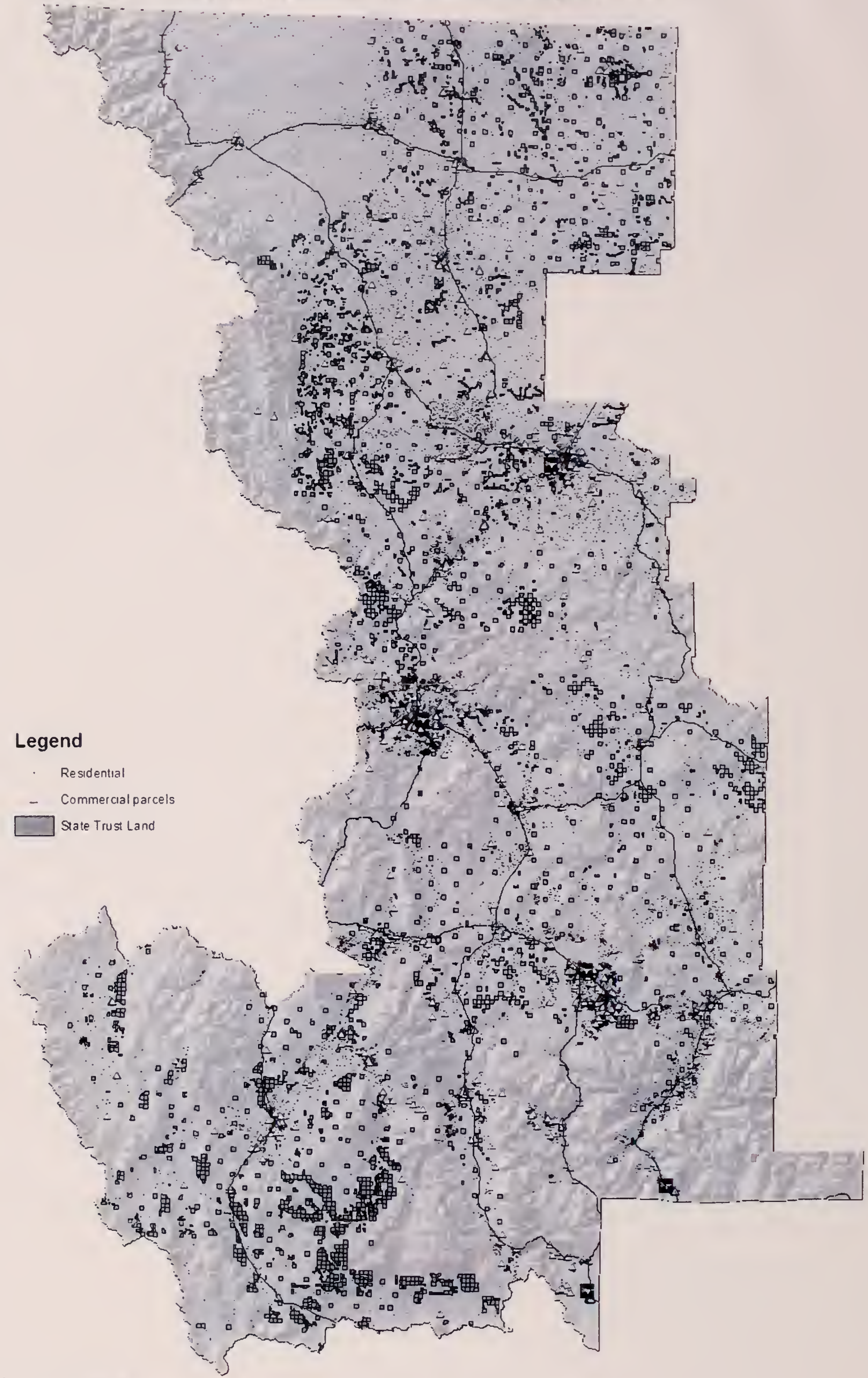
Source: Geodata 2004

Locations of Industrial, Commercial and Residential Uses in SLO



Source: Geodata 2004

Locations of Industrial, Commercial and Residential Uses in CLO



Source Geodata 2004

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